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COMING READJUSTMENTS IN AGRICULTURE— DOMESTIC PHASES*

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THE occasion calls for a reversal of the usual order in analysis of futurities and for viewing the long-range impending developments before the short-range ones. In fact, very little of the analysis following assumes a time-span of less than thirty years. In this long-range analysis, a world viewpoint is needed, and hence some attention to international relationships, but this will be kept at a minimum to avoid encroachment on the other half of this program. A further assumption is that the world will escape another war within the span of years taken

The primary long-range factor in future agricultural development is the balance of population growth and food-fibre supply, and this will receive major attention in this paper. The public has been stampeded in the last year or two into a frenzy of wild talk about a world threatened with starvation because the world's population is increasing faster than the food supply. We have been warned that the world's population is now increasing at the rate of twenty million a year. Mr. Norris Dodd of the FAO has said that somewhere in the world 57,000 new mouths are sitting down to breakfast each morning. One frantic writer believes that the situation is so urgent that converting a sizable fraction of the human males into eunuchs is a reasonable solution of it.¹

* A paper presented at a joint meeting of the American Economic Association and the American Farm Economic Association at Cleveland, Ohio, December 30, 1948

¹ The latest example of this is the burst of Sir Hartley Shawcross, Britain's attorney-general, that made the front page in the *New York Times* December 19. One can understand why the British, thinking rationally, although in the short-run, would like to see food as cheap again as it was most of the time from 1921 to 1940. But this does not fully account for the British attitude on this subject. If we in the United States had lived through the world war and since on the same diets as the British, and much of the time in fear that next month might bring actual starvation, we might very well be in the same morbid state of mind on the subject of food.

So far as I have observed, no social scientist with repute among authentic social scientists has been drawn into this stampede. It will be remembered by many of you that it was a biologist who did the principal alarming after the first World War, my former Harvard Colleague, Edward Murray East, in his "Mankind at the Crossroads." The alarmists this time are either biologists or men who think more like biologists than they do like social scientists. Basically, they think of the human race as an immense drove of hogs feeding out of one big common trough. They may deny this when you face them with it, but it nevertheless underlies and pre-determines all their thinking.

The social scientist approaches this problem like all others in terms of existent or potential social units or aggregates. For some phases of the population-food supply relationship, the nation is the appropriate aggregate, for others, groups of nations in one trading bloc, for others, on the other hand, segments of nations, such as our own South, or the Maritime provinces of Canada. For certain aspects of this problem, the aggregate will be as small as the group of Spanish-Americans living in the upper Rio Grande Valley of New Mexico. In analyzing the relationship of population to food supply, the underlying issue in the social scientist's approach is whether, for any one such social aggregate, *the rate of improvement in the arts is as fast as, or faster, than the rate of population increase*. If the rate for the arts is faster than that for the population, standards of living are sure to be rising, except that temporarily, as in Russia in some recent decades, and in much of Europe at this stage, the gains may be diverted to capital formation.

The arts in any such balancing are not merely the agricultural arts. For a nation to increase its aggregate or per-capita industrial output so as to be able to import more food may be as effective as to increase its food-fibre output per worker on its farms; and likewise to improve its transport facilities to handle food and other products more effectively.

It is entirely possible, however, that the inability of a social aggregate to increase much its output of food or fibre per worker because of limited available land resources, is the major factor conditioning the rate of increase in the arts and rise in the standard of living. This was apparently the situation in the United States and Western Europe in the early years of the present century. Prices of food and fibres rose more rapidly than of most other

products from around 1900 to around 1920. There is considerable evidence that the turn would have come as early as 1915-16 except for the first world war. From 1920 to the second world war, the arts of food and fibre production kept fully up with, and surely exceeded in some years, the arts in the rest of the economies of this group of nations.

We need to get more clearly in mind the social aggregate that we are talking about in the foregoing. It actually includes more than the United States and Western Europe. Although it is most conveniently called "The Western Trading Bloc," it really includes all the exporting countries that supply Western Europe with food and fibre in sizable volume.

For population and food-supply analysis, however, it is not sufficient to define such aggregate solely in terms of exchange of goods—exchange of populations also enters into it. Europe may accept the sugar, rubber and tea of the East Indies and Southeast Asia; but it does not accept its peoples as immigrants. Consequently these Eastern countries have to work out by themselves, in the main, their own balances of increases in the arts and increases in population. They are not part of the same social aggregate so far as population relationships are involved, as are Western Europe, the United States, Canada, Latin America, Australia, New Zealand and South Africa.

What happens, it follows, to the balance of population and food supply in India or China, to be specific, has very little direct bearing on that balance in the United States, or in France, or Sweden, or even the United Kingdom. There may come a time when exchange of foods and of products and of populations, between North America or Western Europe and the Far East, will be free enough so that the balance of rates in increase in the arts and in population in one of this pair figure importantly in standards of living in the other. But that is still far removed. Efforts of FAO and the other units in the United Nations should be directed toward hastening that day, but other more important objects must not be sacrificed for this one.

As for the general argument that the countries with good diets should share their food with the peoples of the densely populated regions, one has only to point out that if they had done this in the past three hundred years, most of them would now be down close to the Malthusian level of subsistence. The hope of the world is in

the countries that have escaped such a fate and that can now help the rest of the world to escape from it. And if these fortunate countries are not to dissipate their precious chance to help, they must guard carefully against measures that may seem helpful on the surface but in the end will only drag them down toward the Malthusian level. And the Malthusian countries must guard equally carefully against permitting such mistakes to be made ostensibly in their behalf.

How much of the world is already at the stage where its arts are advancing faster than its population? Our Chairman, Howard Tolley, considered this point in a paper read before the American Academy of the Advancement of Science in December 1946, recently published in a Symposium "Freedom From Want,"² and concluded that only forty per cent of the earth's human population is now living in countries which on the average have reached this stage. The progress of humanity toward a goal of food enough for all, it is pointed out in another paper in this same symposium, is measured by the number and size of the population groups that are added to this forty per cent. The forty per cent which Mr. Tolley mentioned will become fifty percent in a few decades, then 60 percent, etc. How long before countries like China and India will start on their way toward their optima? They, as a matter of fact, probably have but one direction in which to go. They probably are already close to their lowest possible limit. But they are likely to rise from this level rather slowly at the start—even if they make mighty strides in agricultural technology and industrialization. The gains for a few decades will mainly take the form of less disease and misery, and longer, healthier lives. The accompanying rise in the ratio of production to maintenance rations in their diets will presently, however, begin to manifest itself in rising levels of living, and this in a few decades in declining birthrates. Unless this stage is presently reached, the gains will be lost and the countries will start backwards and downwards again away from their optima.

It follows from the foregoing that each country must work out a solution for itself along the lines indicated. No country can do it for another. Such a statement is wholly in keeping with the pronouncements of the Hot Springs Conference on Food and Agriculture. Number one of these pronouncements was that enough food

² P. 218 ff., Vol. 11, No. 4, *Chronica Botanica*, Waltham, Mass.

can be produced in the world to give all peoples the food they need for health and working efficiency. Number two was that the task of doing this is the responsibility of each nation. Number three was that the task can be done more effectively, however, if the nations help each other to do it.

The reader may be objecting at this point to putting all of western Europe in one social aggregate, and all of Latin America. What about Spain's progress in the arts? and Puerto Rico's? Logically there is no difference between grouping these with the rest of Europe and of North America, and considering the United States or Canada as all one aggregate. Spain, like the South within the United States, and Quebec within Canada, is a sub-aggregate within a larger one. The sub-aggregates work out their own balances between population growth and the arts more or less as do nations or groups of nations. Generally, however, the institutional concomitants are different. Thus exchange of food and other products is almost certain to be freer within a nation than among nations, and more important, population movements are freer. As long, however, as important differences in man-land ratios, in outputs per worker, and in levels of living, persist among provinces or regions within a country, separate social sub-aggregates exist.

The foregoing suggests the query as to how progress in the population-food-supply balance occurs within such aggregates. The answer is that generally it does not take the form of raising the average level of the whole group at one time. Instead it mainly takes the form of accretions to the groups of families that have already been able to raise their levels of living by keeping the numbers in their families adjusted to their abilities to feed, clothe and educate them. Even the so-called Malthusian countries have considerable blocks of families that have made this adjustment. These blocks are expanding. Sometimes, however, progress in this direction is greatly aided in particular areas by a sudden increase in output and earnings arising from new industries, land developments, technologies and the like. Commonly in such situations only part of the families sink all their gains in the feeding of more mouths. Also out-migration from a region can be large enough to help importantly—it was in the case of Ireland, Norway and other countries of Europe in the 19th century. Ordinarily, however, it helps much the families that migrate and very little those left behind.

At this point, it will be wise to stop and deal briefly with a correlative aspect of threatened world starvation—namely, the threat of “continents sliding into the sea.” We are also being told by some that this country has already lost a fourth of its “irreplaceable” topsoil, and hence, by implication, a fourth of its potential ability to feed its people. Such writing and talking puts the informed social scientist of this country in an unhappy position. He knows full well that this country has carried the exploitation of much of its farm lands too far, and that not to replace these exploitative methods with methods that will maintain the soils at a good level of productivity, and do this rapidly over the next few decades, is very poor economy. He therefore does not want to say or do anything that will make the efforts of the conservationists less effective. Still, he is obliged to say when he meets with his fellow social scientists, as on this occasion, that neither the people of his own country nor those of Western Europe, are faced by dire hunger if they go about this more slowly. Only a minor fraction of this lost topsoil is irreplaceable. Much of it could be replaced in five or ten years. But not without losses in yields and sizable direct outlays on fertilizer, seed, etc. It is far better economy to farm in such a way as to keep much more of the topsoil in place and save these losses and outlays. Moreover, unless vigorous measures of this sort are taken, considerable land already seriously eroded will become so badly worn in the next two or three decades that it will have only low-order agricultural use, or perhaps only timberland use, in the half-century or more following. And of course those lands which have shallow, or sandy or gravelly, or otherwise non-tillable subsoils, can be ruined for good by prolonged erosion. Still, the balanced judgment must be that if we continue with the measures for maintaining the productivity of farm lands that are now under development in this country, most of the irretrievable losses will be prevented.

As for Western Europe, most of it has been farmed for centuries in ways that maintain a relatively high level of productivity. The strong shift toward more forage crops and livestock in the last hundred years has contributed importantly to this result.

The sensible report to make on conservation as a phase of the food-supply-population ratio is therefore that so far as the social aggregate that includes the United States and Western Europe is concerned, the management of its farm lands could easily be heed-

less enough of the future to reduce the levels of food consumption in the next fifty or one hundred years; but, barring further destructive wars, it would have to be almost unbelievably bad to lead ultimately to mass hunger. The reasonable expectation is that the management will improve rather than retrograde.

We need next to consider more specifically the part that technology and progress in the arts may play in the population food-supply relationship in our particular social aggregate. First as to the technologies of agriculture. The turning point in the race between population growth and progress in the agricultural arts that probably came around 1915-16 was the result more of the application of science and new inventions to agriculture than of pushing out the extensive margins. In some measure, these two processes supplement each other—the new technology, for example, made feasible the utilization of more semi-arid land. The limiting factor on increase in agricultural output from 1920 to 1940 was the ability of the population in our social aggregate to buy the product of our acres. In spite of the acreage controls finally adopted in 1933, total agricultural output in the United States increased 8 percent between 1933 and 1939. With the sudden new outlets created by World War II, output increased a third and still prices of food and fibres rose to their present high levels. The major part of the increased agricultural output of the years since 1939 appears to have been due to higher technical intensity of cultivation and new applications of technology. There was a very large backlog of technologies only sparingly used in 1940. My friends in the Agricultural Research Administration of the USDA tell me that there is a surprisingly larger backlog today than in 1940. Combinations of use of hybrid seed, pest control, heavier liming and fertilization, and better tillage, are producing large yield increases. It has recently been reported that 600 farmers in North Carolina have obtained corn yields of 100 bushels or more per acre in 1948. Such yields make it possible to grow all the cultivated crops needed on the level or nearly level lands. The potential gains from pasture and forage improvements are the most important of all. The possible gains in livestock production are mainly from such things as artificial insemination, and feeding at rates that reduce the proportion of the feed going into maintenance. Finally, new engineering developments are making feasible the conversion to more intensive use of much land formerly considered too dry, too wet, too subject to

floods, too stony, too rough, or covered with brush. Outlets, and accompanying prices, will again be the limiting factor in expansion of agricultural production. Except for the incidence of a period of subnormal rainfall, such as 1931-36, outlets will begin seriously to limit agricultural expansion in the United States as early as 1950-51. This will be true with or without crop-control measures.

What will be the impact of mechanization on these developments? Family economic units will become larger. Many small un-economic units will be absorbed into neighboring farms. Proportionately fewer workers will produce the food and fibre for a population still more urban occupationally. Farm incomes will rise per farm and per worker, even though prices of farm products are likely to decline relatively over the next few decades, at least of those products that lend themselves to mechanization.

The nations of Europe will no doubt strive to become more self-sufficient in food in the next decade or two. Part of them can increase yields considerably by a freer use of commercial fertilizer than before the war and by adopting the newer technologies of breeding and pest control. Surely, for example, corn hybrids can be developed that are adapted to the climates of southern Europe. That land developments are still possible in limited measure is illustrated by the plans under way to convert to good pasture land the heather- and bracken-covered moors of the British Isles.

If self-sufficiency had been the sole object, Western Europe could have achieved this in the 1930's simply by shifting about 3 percent of its land used to grow feed for livestock to growing cereal and root crops for direct human consumption. This kind of self-sufficiency is within the reach of Western Europe within a very few years. To attain diets with prewar levels of meat, dairy products and eggs may take eight or ten years.

Let us now consider briefly the relation to the foregoing of technological progress outside of agriculture. There can be no doubt that larger outputs per worker in industry and trade provide buying power for more farm products, and more actual spending for food. If the average consuming unit in the United States had consumed the same food in 1948 as in 1935-39, it would have devoted 21 percent of its disposable income to food. It actually devoted 28 percent of it to food. Its income had increased 2.8 times; its food expenditure 3.0 times. The general price level had risen 2.0 times; retail food prices, 2.2 times. The index of physical food consump-

tion now being projected for 1948 is 112 on the 1935-39 base. In its peak year, 1946, the comparable index was 118. It is commonly believed that shortages of other goods contributed to the high expenditures on food in 1945-46. The 112 is more nearly normal for current income levels.³

The larger real incomes of recent years have been due much more, of course, to steady employment than to technological advances. But the impact on buying power is roughly the same in either case.

It may help us to judge possible gains from technological advance in the next decade to review developments following World War I. Output per worker in manufacturing employment increased nearly a half in the decade of the 1920's. Industry, by 1927-29 at least, found ways of paying the much higher wages that came out of the first world war, provide relatively full employment, and make large profits at the end. The gains in output per worker were of course much less than this in construction and mining, and still less in trade. To obtain its personnel, trade had more or less to meet the wage competition of other employments. It met this situation in part by raising margins—on food the rise between 1913 and 1927 was from 53 to 59 percent of the consumers' dollar. The average increase in output per worker was obviously much lower than for manufacturing alone—probably no more than a third of it. The index of per-capita physical food purchases is calculated to have risen from 96 to 102 during the decade of the 1920's.

As for the decade of the 1930's, the trends are so much obscured by the Big Depression and its aftermath, and by several institutional adjustments, such as in the shortening of the work week, that little more than conjecture is possible. By 1938-40, labor in industry, when employed, was appreciably more productive per hour than in 1928-30, and even a little more per work-week. Food margins had risen to 61 percent of the consumers' dollar. The index of per-capita food consumption had risen to 104 by 1939.

A simple projection of the gains in per-capita income and in food consumption of the 1920-40 decades forward to 1970 gives the results appearing in the first column of the table following. The second column combines these advances with a projected 23-percent increase in the population.

³ The index forecasted for 1950 in Black and Kiefer's "Future Food and Agriculture Policy" (p. 124) is 113 for "high-level" employment, and 109 for "moderate" employment.

It will be obvious from this table that the agricultural adjustment problem facing this country in the next two decades is something different than simply expanding overall food production. Little if any increase in cereals is called for, so far as domestic needs are concerned. The land to produce all the other plant products on the

1970: PERCENTAGE CHANGES FROM 1935 TO 1939 (+ OR -)¹

Food Groups	Per-capita changes	Per-capita changes combined with population increase of 23 per cent
Cereals . . .	-24	- 4
Potatoes .	+18	+ 49
Sugar .	+13	+ 42
Fats and oils	- 1	+ 25
Pulses	- 3	+ 22
Tomatoes and citrus fruits	+96	+147
Vegetables—green, leafy and yellow	+15	+ 45
Other vegetables and fruits	+28	+ 61
Eggs.	+33	+ 68
Meat, poultry, and fish.	+48	+ 86
Milk.	+17	+ 47
Consumption index . . .	122	150

¹ From Black and Kiefer, *Future Food and Agriculture Policy*.

list can easily be obtained. This country could increase its potato and sugar outputs five-fold if these were the foods most needed. The crucial question is whether this country can increase its feed and forage production around 65 percent over 1935-39 to provide the increase in meat, milk and eggs. The judgment of this writer is that it can, and rather easily. The livestock production of 1945-47 was already fully half way to this goal. Further increases in yields plus further land improvements, all within easy view, can supply all the feed and forage required for the increased output of meat, milk and eggs listed in the table. If progress in the industrial arts were twice that assumed in the table, the land resources of the United States would still be equal to the task.

If the population of the United States pretty much levels out after 1975 as now predicted, after that there will be only the rising level of per-capita food consumption to provide for.

A parallel analysis of Western Europe's prospects can reasonably assume a definitely slower rate of advance in industrial and related

technologies. Notestein and his Princeton associates have predicted a leveling out of population growth in Europe exclusive of Russia even earlier than in the United States. The most determinative factor in the ability of the nations of Western Europe to raise their dietary levels by including more meat, milk, and eggs, will be their ability to export industrial products and thus obtain the needed exchange with which to buy livestock feeds. Even with little improvement on this score, at least small gains should be possible in most of the countries when their populations stop growing.

The foregoing analysis has no doubt gone too far in assuming first the United States and then the Western Trading Bloc as more or less separate entities. First of all, full analysis must recognize that the people of the United States will consume more imported foods and fibres as their earnings rise. This will in turn release some foods for export. Agricultural imports may very well increase more than agricultural exports.

Second, the individual countries of Latin America present a highly varied set of conditions with respect to potential resource development, population density, and dependence upon exports and imports. This is true but in lesser measure of the countries of Western Europe. A full analysis calls for separate consideration of these countries as sub-aggregates within the larger framework here constructed.

Third, industrialization in the Far East, when and as fast as it occurs, may gradually provide a little new buying power for the foods and fibres of the countries with low man-land ratios. For the most part, the markets for the industrial products of these countries will be within their own countries. They cannot expect to invade foreign markets for industrial products in any large way.

Some one may be inclined to ask what allowance is made in the foregoing statements for the activities of FAO in promoting freer exchange of food between the exporting and deficit nations. The answer is "None." It is possible that surpluses of some products will become so large in the next three, five, or ten years that the United States and some other nations may take steps to make these available to other nations at special prices. The FAO itself has not taken any steps in this direction, although this was provided for in the Preparatory Commission's program for a world food board that was adopted at the Geneva Conference of FAO in 1947. In fact, it was one of the principal recommendations of that conference.

All of the analysis thus far is in terms of trends over the next several decades. If nothing worse, there may be one or two major booms and depressions within this time span, and surely there will be minor ones. These will produce departures from the trends in both directions, and have the general effect of retarding the rise toward higher levels of income and consumption. In terms of 1935-39 levels of food consumption, a major depression that might come around 1960 if history repeats itself could reduce food consumption to an index level of 103 per capita, or 121 allowing for an 18-percent increase in population by then. The comparable consumption index for moderate employment would be around 133-35, and for high-level employment, around 140.

It should be obvious from the foregoing that overall production and consumption of foods and fibres can easily get out of line with each other. It would be expecting almost the miraculous from our economy if aggregate food and fibre production expanded exactly in line with the growth of population and rise in buying power at home and abroad. The chances for maladjustments by individual products are much greater than for aggregates. Keeping such maladjustments from becoming too serious is the major task of those who have responsibility for the course of public and private affairs.

The first line which aids to better adjustment of production and consumption should take is supplying the entrepreneurs involved with the clearest and fullest possible information as to trends in production and consumption and current departures from these. We never have done this with anything like thoroughness and hence do not know how adequate such a program would prove to be. To be safe over the next several decades we therefore need also to try out other methods with part of our products. The last Congress introduced for the first time, to go into effect with the six basic crops on January 1, 1950, a formula device for adjusting prices according to carryovers plus the new crop. This is a very crude first design of what could be developed into an instrument that might well keep production and consumption in fair balance from year to year. What such an instrument might look like in its more developed form is suggested by the formula now in use in the Boston milkshed for adjusting milk prices. This formula includes a measure of changing demand and one of change in the prices of its two most important and most price-sensitive cost factors, and an adjustment for the changing balance of supply and demand. The

adjustments provided in the Agricultural Act of 1948 for the non-basic farm products are largely at the discretion of the Secretary of Agriculture. He would do well while he has a chance to try out carefully designed formulas like the Boston milkshed formula for a number of these products.

One step further than this is forward-pricing—that is, announcing in advance the price which it is believed will keep supply and demand in balance. Forward-pricing is likely to prove more workable if there is combined with it some provision of the sort in the Act of 1948 for adjusting the price with the size of the crop when it is harvested.

Any one of these three devices, if it is really to do the job needed, must be supplemented by provisions for storage of abnormally large outputs and also for distribution outside the usual channels of trade, the latter not just on an emergency basis, but more importantly, on a planned combined production- and consumption-adjustment basis which shifts resources into desired lines of production instead of waiting for surpluses to arise.

Unless consumption and production are kept in reasonable adjustment by such methods as these, we shall have individual producer quotas again, and very soon in the case of cotton. Applied in their prewar form, that is, based on past production, these can be exceedingly damaging to the agricultural economy. The least objectionable of such quota systems is the one which would limit the quotas to a share in the domestic demand for the product, which share would sell at whatever price it would bring in the regular domestic market, and leave the producer free to produce what he wants to for export, and more particularly for disposal outside of the usual channels of domestic and foreign trade, at a lower level of prices. One proposal is to limit the individual quotas to a fraction, perhaps a half, of the individual producer's share in the domestic market, such share being based upon a 3-year or 5-year moving average of his past production. This procedure would still retard needed adjustments in production, but probably not disastrously.

The task of maintaining good adjustment is of course made much more difficult by the short-run cyclical variations in buying power and consumption mentioned earlier. Especially do they accentuate the need for supplementary food- and fibre-distribution programs. They may also require, for practical reasons, *some form of farm*

income supplements. The less that these are made in cash handouts, and the more in the form of aid to needed production and consumption adjustments, the more helpful they will be.

A final brief word as to the probable direction that adjustments will need to take in several sectors of our agriculture. The Northeast is likely to see increasing relative demand for dairy products. This will induce improved pasture and forage management, more mechanization, larger family farm units, and a growing confidence in the agricultural outlook for the region. The accompanying gains in efficiency should make relatively lower prices possible. The acreage in crops will increase very little, but considerable brushy pasture will be improved.

The only changes in the Corn Belt will be a general moderate intensification of farming, achieved by use of more machinery, power, and fertilizer, rather than by the use of more labor. Still more of the smaller farms will be absorbed into fully mechanized family farms. Cultivated crops will tend to be concentrated in the more nearly level lands, and the sloping lands will go into longer rotations and under more intensive grassland management. Meat prices will decline less relatively than dairy product prices.

Farming in the Great Plains will become more diversified. Farming systems which combine crops with livestock will be pushed farther westward. More range will become pasture, and more winter forage will be grown. The region will depend less on wheat as time goes on in spite of immediate developments in the other direction.

The South will see the largest readjustments of any major part of the country. Over large sections of the South, cotton will decline to the position of an important supplementary cash crop. The core of the farming systems in these parts of the region will be the growing of forage, corn, and winter small grains and feeding these, first, to dairy cattle, second, to beef cattle, and third, to swine. The farms over large areas will go under intensive grassland management. Needless to state, accompanying these changes will be a large absorption of small farms into neighboring farms to make economic units of the type indicated for the Northeast, which will make as full use as they can of modern power equipment. The prospective changes in this direction are so great that they will not be completed in less than half a century unless private and public credit and farm planning services are provided in large measure.

In the parts of the South where cotton can be grown in fairly large fields under full mechanization, with yields of a bale per acre or more, cotton growing will not only persist, but will expand somewhat. This will also be true in the western areas with lighter rainfall and low yields lending themselves to other types of mechanization.

Vegetable and fruit growing will expand moderately, especially in the South and Far West, to provide for our growing population and larger inclusion of these foods in our diets.

Does not this brief exhibit point to the simple observation that with adjustments of this order in prospect over the next several decades, the economists working in agriculture have an unusual opportunity to be highly useful, but also to be obstructive; and this is surely true of whatever measures of public aid are adopted. Both can function, and have functioned, in both of these ways. The obstruction is most likely to come from those who think they know most about it because they have been living with it most closely.

DISCUSSION OF PROFESSOR JOHN D. BLACK'S PAPER*

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PROFESSOR BLACK with characteristic vigor, delights in calling a spade a spade. He will have no truck with the food-population rubbish that has come to shore in the backwash since the war. Those few biologists and popular writers who are commercializing on this rubbish will find Professor Black's analysis too distasteful and too rough for their neo-malthusian fiction intended to instill fear and consternation into our optimistic souls. Or is it motivated simply to acquire a bonanza from the sales of books on this topic? Professor Black's cryptic observations both on the different social aggregates in relation to food and population, and on soil conservation, are timely; they should clear the air on these issues.

In putting his case for separating the social aggregate of India, or of China, and that of the United States in analyzing the forces affecting the population-food balance, Professor Black of 1948 is quite at variance with Professor Black of 1946. As between the two, it will be apparent at once why I prefer the views that he has expressed in the present paper. At the meeting of the Farm Economic Association in Philadelphia, in 1946, in commenting on my paper, "Food, Agriculture, and Trade," Professor Black felt that I was altogether too negative in emphasizing the economic separation that exists between these populations with altogether too little food and those with virtually enough food. I stressed at that time the slow, nevertheless significant welfare contributions that could be achieved by trade and by capital movements among countries in a trading world. On all of this, Professor Black made this comment "... Professor Schultz's program in the international field consists, practically speaking, of relying upon such transfers . . . as may be induced by freer exchange of farm products and freer investment of capital in foreign industrial ventures, and upon the slow evolution of international institutions for stabilizing employ-

* A discussion presented at a joint meeting of the American Economic Association and the American Farm Economic Association at Cleveland, Ohio, December 30, 1948.

ment, with intervening use of such buffer arrangements as may slowly evolve. Other measures are to be set aside to give these three a chance to evolve. The FAO program, insofar as not included in the three types of measures favored, becomes a program merely of 'the extension of knowledge of nutrition,' and 'the export of technology and skills.' This reviewer is unable to look upon such a diagnosis of the situation as other than preponderantly negative."

Compare this remark of two years ago with that in the paper before us, "... industrialization in the Far East ... may gradually provide a little more buying power. ... The markets for the industrial products of these countries will be within their own countries. They cannot expect to invade foreign markets for industrial products in a big way ... someone may be inclined to ask what allowance is made in the foregoing statements for the activities of FAO in promoting freer exchange of food between the exporting and deficit nations. The answer is, 'none'."

I realize that it is altogether too easy to get remarks of this kind out of their context. In focusing his guns on the population scares that are now current, Professor Black has taken good aim, firing from well-chosen ground. In applauding the effectiveness of his shots, I merely went to indicate that in achieving his objectives he has left altogether too little room for the international efforts of FAO or of other groups and organizations in terms of positive contributions that they can make to important aspects of the food-population problems in the world.

Let me close this review by calling attention to several subsidiary matters:

- 1 Professor Black expresses the belief that 1915-16 was probably the turning date when the forces increasing the supply of food overtook and outdistanced the forces increasing the demand for food in the United States. The importance of such a turning point can hardly be overrated. I feel that Professor Black's insight on this matter should be formulated as a hypothesis and put to a careful test, not so much for the purpose of ascertaining the exact date, for that is not nearly so important as determining the nature of the forces and their respective importance in the food-population mechanism of the United States.
2. Professor Black states at one point in his paper, that "Outlets, and accompanying prices, will again be the limiting factor in expansion of agricultural production."

Relative prices in any viable price economy are by definition the

apparatus that controls the allocation of resources. Accordingly, no matter how high or how low the price is under given supply and demand conditions, it establishes both the upper and lower limits to the amount of resources that will be utilized in farming. In this context, the above statement as it stands is not a meaningful proposition since it is always true by definition. My point is simply this, that some restrictions are required to give this statement meaning. I recognize that the necessary restrictions are implicit in Professor Black's argument, but to avoid misunderstanding, they should be made explicit.

3. Professor Black's succinct review of "the part that technology and progress in the arts" have played in increasing the supply of food can, of course, be elaborated. I would be inclined to place somewhat more emphasis on the declining importance of land which has occurred as a result of the ease with which new forms of capital can be substituted for land resources. Moreover, the resources devoted to the improvement of the state of the arts in agriculture, including both research and extension activities, continue to run exceptionally high. The best years are in all probability still on ahead.
4. Professor Black anticipates an early return to individual producer quotas, especially in the case of cotton. He views these as damaging but finds quotas designed to induce export dumping "the least objectionable." By what standards, he does not indicate. The policy implications of this statement by Professor Black are as disturbing as they are far reaching.
5. The outline listing the adjustments that seem likely for the agriculture of the Northeast, Corn Belt, Great Plains, South, and the Far west, is full of valuable insights. One sentence however, puzzles me. It is, "Meat prices will decline less relatively than dairy product prices" No bench mark is given. Surely, Professor Black is not taking 1948 as his point of departure.

But all of these pin-pricks aside, the paper on which this review has focused, succeeds in putting the problem of the supply of food into a meaningful frame of reference for economic analysis. He is not disposed to conjure the devil in dealing with either conservation or population.

COMING READJUSTMENTS IN AGRICULTURE— THE INTERNATIONAL PHASE*

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IT IS useful and stimulating, upon occasion, to lift one's eyes from routine daily tasks in an attempt to evaluate forthcoming developments. It is only by placing our daily activities in the context of long-term policies and goals that we can give meaning and direction to the concrete piece-meal problems which daily confront us. Without such stocktaking we are in danger of losing ourselves in a maze of trivia. Even governmental administrators—or should I say especially governmental administrators—require such periodic stocktaking. But the difficulties are great. It seems as if the very nature of public administration, the duties and problems which land on one's desk every hour of the day, make the task of long-term thinking something to be put off until tomorrow. It is perhaps inevitable that the next step should be to make a virtue of the necessities of life in a governmental office and to regard with a certain amused skepticism the planners and visionaries.

It will be useful to state a few basic assumptions which underlie my thinking on the coming readjustments in agriculture.

The first of these is that, for better or worse, government will consciously "interfere" more in the future than in the past with the activities of the individual, in what it considers to be the social and economic interests of the entire group. Such conscious interference may, of course, be no greater than that which it has exercised, frequently unconsciously, in the past. Moreover, the interference may be largely, if not wholly, of the incentive type which appeals to the economic egoism of the individual and not of the regulatory or restrictive type which is often associated with governmental paternalism.

The second assumption is that the economic and social planning of governments will continue to be influenced by national political and military considerations, but that over the next decade or two—which is as far as the writer is prepared to probe the future—these considerations will be less a determinant of government policies

* A paper presented at a joint meeting of the American Economic Association and the American Farm Economic Association at Cleveland, Ohio, December 30, 1948.

than in the past. The ramifications and extent of the impact of political and military considerations on economic policy will, of course, vary from country to country in accordance with the political and military problems which it appears to confront and in accordance with the evaluation of future trends in the political-military sphere which its statesmen adopt. Some countries may, indeed, follow a policy of depressing production and consumption of goods and services which do not serve to further essential military purposes. But these instances are assumed to be relatively the exception rather than the rule. The writer realizes that this assumption may be invalidated by future events, but any other appears to him to be the council of defeat.

The third assumption, indeed this can be stated as a fact, is that the world's population will continue to increase steadily during the next few decades and that, in the absence of governmental measures to prevent or minimize it, any increase in the real income of any population group reflects itself in an increased demand for the products of agriculture. Whether the increase in demand for such products is more or less than proportional to the increase in real income is, and if the writer remembers correctly has been, a matter of some debate.

Finally, it is assumed that the world's agricultural plant is capable of meeting future demand for its products without a disproportionate increase in the resources devoted to agricultural production. Indeed, the writer is prepared to put this assumption in the "fact" class, and consequently agree completely with the remarks Dr. Black has just made on this subject.

Let us now, on the basis of these assumptions, consider the possible impacts on agriculture of the current conscious governmental emphasis on capital formation, which seems to the writer to be the outstanding socio-economic postwar development. The reasons for this emphasis need not detain us long. One is, of course, the physical destruction of World War II—a war which cost, according to recent estimates, more than 1,352 billion dollars, seven times the cost of World War I. Another is our advancement from kindergarten to first grade—the writer hesitates to say from grade school to high school—in our knowledge and understanding of the science of economics and its application to our daily problems. A third, although the validity of this reason may be debated, is the growing belief that the economic interest of the individual and of the group

are not necessarily synonymous. Be that as it may, one can hardly turn to any part of the world today without seeing the evidence on every hand. Development programs, or should we say plans since implementation still lags far behind, are the order of the day—industrial development, agricultural development, colonial development, ad infinitum, and as the obverse side of the coin—austerity programs!

It is, of course, axiomatic that the larger the proportion of the gross national product devoted to capital formation, the smaller must be the proportion available for current consumption. In major part, the products of agriculture are currently consumed. It follows, then, that during the accelerated capital formation period—referred to hereafter as Phase I¹—the efforts of governments will be directed to reducing the effective demand for, or the availability of, of, agricultural products as a group by means of any or all of the devices that are available to it—high individual taxes, forced or high-pressured savings, rationing, import controls, and the like.

Obviously the compressibility of current consumption varies greatly from country to country. It is of one order of magnitude in a country with relatively high "standards of living" and of an entirely different order in a country where most of the inhabitants are at, or below, a bare subsistence level. The rate of potential capital formation, it may be noted in passing, is not only a function of the compressibility of current consumption, but of the extent of a country's idle productive capacity. The United States, for example, devoted nearly 45 percent of its current output in 1944-45 to the war and at the same time was able to provide its civilian population with 10 to 15 percent more goods and services per capita than in 1938. The United Kingdom, on the other hand, devoted only slightly more—about 50 percent—of its current production to the war effort but had to cut the supplies of goods and services 15 to 20 percent below prewar.²

Let us hasten to add that the compressibility of current consumption as a concomitant of capital formation is much more than a

¹ Phase I may be defined as the period beginning a year or so after the end of the war and ending when current production would thereafter be sufficient to maintain the quantity and quality of current consumption at the prewar level, or for some countries with a very low prewar consumption, at a somewhat higher level reflecting minimum standards of health, working ability and morale. The length of Phase I will, of course, vary from country to country.

² The Impact of the War on Civilian Consumption in the United Kingdom, the United States and Canada. G. P. O. 1945.

mathematical function of the standard of living. It is influenced by an enormous range of social, political, physical and psychological factors. Leaving all other considerations aside, the United Kingdom can compress current consumption infinitely more than France or Denmark merely by virtue of the physical fact that it imports such a large percentage of the commodities falling into this category.

Of special significance during Phase I is the impact of governmental programs of capital formation on the consumption and production of individual agricultural products or groups of these products. First of all, it must be recognized that even in the case of countries with a high standard of living the compressibility of the physical volume of food consumption is relatively limited, particularly over any considerable period of time and if adequate recognition is given to the necessity of maintaining the health and vigor to do an "honest day's work." Perhaps the best single measure of physical food consumption is caloric intake. Very few countries would find it possible to cut their caloric intake by more than 10 or 15 percent without a disproportionate loss in national output.³ Hence, most countries will in any event, if at all possible, plan to produce or import sufficient food to maintain caloric intake at or near prewar levels.

The effect on current consumption of concentration on capital formation becomes even more apparent when the qualitative composition of the projected consumption patterns is examined. Stress is laid on the production or importation of those foods which constitute cheap sources of energy—primarily carbohydrates such as cereals, potatoes, and, to a lesser extent, sugar. On the other hand, the production and especially the importation of high cost foods are to be discouraged or limited to the extent permitted by physiological considerations and the willingness of the individual consumer to accept changes in long ingrained eating habits.

Administratively, this two-fold policy is relatively easy to implement in so far as imports are concerned—and the impact on the foreign producers is apt to be direct, and in the instance of producers of high-cost foods, painful. Its specific implications on American agriculture will be examined later on in this paper. The domestic producer, on the other hand, is very apt to find this policy

³ Average daily per capita caloric intake in Germany in 1946-47 was about 25 percent below prewar, but distortions between urban and rural consumers as a result of the low national average made large segments of the urban population incapable of doing sustained physical or even sedentary work.

rather to his liking. The average consumer tends to be a rather unreconstructed individual whose taste and demand for "high-cost" foods is not going to disappear merely because his government has decided to undertake a vigorous program of capital formation, as long as he has the financial resources and would rather spend than save. So the government has to attempt to contain this demand by various and sundry measures ranging from high individual taxes to rationing. Frequently the measures are inadequate or unenforced so inflation and black markets become more or less general. Thus, any government, even though its internal management is effective and its budget exemplary, continuously has to balance the advantages of a rapid rate of capital formation against the internal administrative difficulties so created.

So far we have been considering the "saving" aspect of capital formation. Let us turn briefly now to the investment aspect in Phase I. In what kinds of production should governments invest or guide private investment—in industry, in agriculture, or both, and if the last, in what proportions? This is the crux of the problem and the area in which human fallibility is likely to be most apparent. Purely economic considerations involving the rate of capital formation desired in Phase II, the "comparative advantage" of alternative lines of capital investment, and the plans of other national political entities are only some of the factors which have to be weighed. Others include military considerations and the internal political customs and habits of the past.

Generally it seems to the writer that the tendency will be for a considerable number of countries whose resources and experience suggest that their advantage lies in industrial production to place too much, and therefore uneconomic, emphasis upon capital investment in agricultural production. This tendency appears likely to be accentuated, first, by the fact that the major surplus agricultural producers happen to be hard currency—or "dollar"—areas, and, second, by the fact that the practice of maintaining relatively fixed exchange rates creates what appears to be a physical "dollar shortage." At this point the writer should like to digress long enough to clear his own thinking on this matter.

Since a vast majority of the world's governments maintain rigid control of their official exchange rates, the shortage of dollars appears to be an absolute shortage. If exchange rates were permitted to adjust themselves to one another relatively freely, then the

dollar shortage would manifest itself in the high cost of dollars. Our wartime experiences indicate that most of us have a different psychological reaction to the high cost of a commodity than to an absolute shortage of it.

For a variety of reasons which we cannot consider here, the dollar areas are currently the major source of many vital food imports, and in an effort to save the dollars being spent for these products uneconomic agricultural production plans may be undertaken which would not be initiated if exchange rates were free to reflect relative currency values.

In addition, the rationing of dollars by direct governmental control of the issuance of foreign exchange is bound to result in a different pattern of imports than if it were left to the individual to compete for the scarce dollar exchange resources and to utilize those he acquired as he saw fit. In the latter case imports of high-cost foods would undoubtedly decline greatly but a small flow would be likely to continue; in the former case, they may, and frequently are, cut off entirely.

Finally, it will be noted that in Phase I, food-importing countries will tend, in consonance with their import programs, to emphasize within the domestic agricultural sector the production of low-cost foods—cereals and potatoes among the carbohydrates, and milk among the “protective” foods.

How long is Phase I of capital formation likely to last? No definitive answer is possible. Moreover, it will vary from country to country but some clues may be garnered from the information that has become available on the long-term plans of the countries participating in the European Recovery Program. Phase I, as defined, is expected in the majority of these countries to continue well beyond 1952–53. Consumption of food even by 1952–53 is projected at a level, in terms of its composition, below that of the immediate prewar years, which in themselves were by no means the highest on record.

For 1948–49 the programs of the participating countries contemplate an average caloric intake of about 2,700 per person per day for the entire population, which is about 200 calories above the average of the previous year but 100 calories below the average prewar level, and 600 calories below the current level in the United States. The deterioration in the quality of this year's food intake, as compared with prewar, is even greater. Per capita meat con-

sumption is estimated at about 30 percent below prewar, fats more than 20 percent and dairy products about 10 percent below prewar. And prewar qualitative standards will not be regained, according to present plans, even by the end of the Marshall Plan period in 1952-53. The reduced level of 1948-49 consumption of some high cost foods reflects, of course, reduced current world availabilities but 1952-53 levels constitute planned adjustments which reflect the emphasis on capital formation.

Personally, the writer believes that the improvement will actually be greater than envisaged by the planners. The effects of mechanization to be undertaken during this period of capital investment, greater use of fertilizers and better seed, and expansion in the application of existing scientific knowledge could easily result in more production from the level of investment in agriculture now envisaged. Social pressures may prevent governments from reducing current consumption as now planned, and experience may indicate that current consumption has been compressed well beyond the point of diminishing returns. Somewhat less capital formation and somewhat more current consumption might well result in an increased aggregate output of goods and services even during Phase I.

So far the discussion has been directed to a possible sequence of events in countries where relatively large opportunities exist to compress current consumption. As such it applies most specifically to areas such as Western Europe. But with different time lags it appears equally applicable to other areas. The political and social organizations that have come into existence in Eastern Europe enable the governments to prosecute even more vigorously, though perhaps less effectively, programs of capital formation at the expense of current consumption. But there is one marked difference, which is of special significance. In Western Europe political military forces, as well as lack of viability in relation to the dollar exchange area, are interpreted to require capital investment in agricultural patterns to produce the maximum quantity of low-cost calories, whereas, it would appear to the writer that more emphasis on industrial capital for investment would, in the long run, yield greater economic returns. In contrast, Eastern Europe, due to the political and military situations combined with peculiar agricultural and industrial conditions prevailing in those countries, the very opposite appears to be the case. Capital investment is being

concentrated on industrial development, although with the abundance of land in relation to population and the low levels of agricultural productivity, greater economic returns could unquestionably be obtained if more capital resources were to be expended to stimulate agricultural production.

One of the direct effects of the preoccupation of Western European countries on capital formation in agriculture has been the growth of interest in colonial development. Large schemes to raise colonial production of fats and oils, cereals and other products have been launched and more are in preparation. These schemes involve the expenditure of considerable resources to open up new land areas, to spread mechanization of agriculture, to improve agricultural techniques, and to provide greater inducements to agricultural producers. Perhaps some of the projected investments in colonial agriculture would yield not only quicker returns but larger returns if they were directed to certain countries in middle stages of capital investment in which agricultural output could be substantially increased with only moderate capital expenditures, or to the exploration and development of non-agricultural raw materials.

Most Asiatic countries fall into a sharply different category. Statistics are inadequate for precise measurement of trends and developments. Population continues to increase, however, while political unrest and destruction caused by the war may well have caused the previous very low level of capital formation to become negative, and there are no immediate signs of any sharp reversal in the current situation. To reverse the present trend will not be easy. Very large financial resources will be necessary, in spite of the availability of cheap labor. For the next few years, it is difficult to foresee more than a stabilization of the very low consumption standards existing at present, or at best very slight improvements. Negotiations of international trade and commodity agreements among the countries of the Far East could help. With the limited capital available for investment purposes, it is imperative that it be used so as to secure the highest possible returns. A measure of specialization, with some countries concentrating their capital on industrial development while others use capital resources to develop agricultural production, would unquestionably be prudent; but political forces may influence negatively policies in this sphere. Furthermore, it remains yet to be seen to what extent foreign

capital and foreign scientific know-how will be associated, or, for that matter, will be willing to become associated.

Let us now consider briefly the implications of the preceding analyses on American Agriculture and the readjustments which appear in prospect for it. In order to do so we need to examine the postwar volume and composition of our agricultural exports. According to recent estimates, U. S. Government loans and grants in the three fiscal years beginning July 1, 1945 amounted to 16.6 billion dollars. Private U. S. sources provided in the same period about three and a half billion dollars in the form of loans and gifts. In addition liquidation of foreign gold and dollar assets provided about 5 billion dollars to pay for U. S. goods and services. These were the main sources from which the 25.5 billion dollar balance-of-payments deficit of foreign countries vis-a-vis the United States was paid for in the period from July 1, 1945 to June 30, 1948.

A large proportion of these dollar resources, as well as current dollar earnings were used for the purchase of U. S. agricultural products, which in 1947-48 amounted to 3-4 billion dollars, or about $4\frac{1}{2}$ times the average annual exports during the thirties. Cereals became the most important U. S. agricultural export, by a wide margin. The three year average exports of nearly 475 million bushels of wheat per annum—as compared with an average of about 70 million bushels a year during the thirties—stands as a monument to the capacity of American agriculture to produce, and reveals the character of the new demand. But it must be noted that exports of dairy products, eggs, fresh and processed fruits and tobacco, while large in comparison with prewar for the whole three year period, began to show, by 1947, a marked tendency to decline.

During the period of the Marshall Plan, extraordinary assistance furnished by the United States to Europe will decline from the 5 billion dollar level of the first year to zero in the fifth year. Let us assume for our discussion that it will total 15 billion dollars over four years—about 60 percent of the net balance of payment deficit of the three years which ended on June 30, 1948. Unless, which is highly unlikely, sales of goods and services to the United States and private capital investment abroad, fill the entire gap between 8.5 billion dollars which represents the average annual net balance of payments deficit during the first three postwar years, and about 4 billion dollars which represents the annual average Marshall Plan aid, exports for the period 1948-53 cannot possibly approach

the 1945-48 level. Because of the compression of current consumption during Phase I, high cost agricultural products will be especially vulnerable. On the other hand, a relatively high level of exports of cereals, other low cost foods and products needed for special nutrition programs, for morale, or for incentives may be anticipated since other supply sources do not appear to be in prospect to meet the requirements of the importing countries for these products.

As current programs of capital formation achieve their objective of increasing production of goods and services, i.e., as we move from Phase I to Phase II, the trend in our exports of agricultural products will be influenced to a very considerable degree by our willingness to import (and, in the case of some commodities, at least, by our domestic pricing policies).

The question is the rapidity with which individual countries reach Phase II or indeed whether this stage will be reached in the foreseeable future. If it is not, then any balance which may be achieved is likely to be of a precarious nature, dependent for its survival on consumption below the prewar level, accompanied by restrictions on foreign exchange and foreign trade—and, furthermore, on the maintenance of uneconomic forms of domestic production, at the expense, basically, of the national standard of living. The answer to this question will depend to a very large degree on our ability and willingness to open doors through which foreign countries can bring their products, in ever-increasing quantities, for sale here.

If the preceding analysis is valid, the development of Phase II should witness the maintenance and perhaps even expansion of the demand of many countries for many of the agricultural commodities which have come to figure so prominently in our export picture; but our import policies will be of very great importance in determining whether countries deficient in these agricultural commodities will look to the United States or to other supply areas for meeting their requirements or even do without them and, no less important, the speed with which the transition from Phase I to Phase II is effected.

A PLANNER'S VIEW OF AGRICULTURE'S FUTURE

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IT IS one of the paradoxes of our particular society that we prefer to pretend that we do not plan—not, at least, as a whole society—and that, if we did, some essential liberties would have to be sacrificed. This pretense is less difficult to understand than it is to excuse. It is part of our backward look, part of the larger pretense that the world is simpler than it is, that it is like it used to be. Simple folk prefer simple institutions; and the smarter ones, who know what is occurring, are thus enabled to manage modern complexities to their own advantage. As a matter of fact, much—even most—of the planning in contemporary society is done by those who use it for their own purposes rather than those of the public, a situation which is remedied only slowly as time passes. But it is gradually remedied. Especially, in every crisis, formal and suitable public organizations take over the planning functions. When the crisis is past, there is reaction and most of what has been devised is scrapped.¹ But each time something remains. By now, even in “normal” times, there are at least rudimentary institutions for creating a picture of the future; and there are others which assist in making decisions reflectively rather than capriciously.

In no part of our social life is planning so carefully and so democratically done as in agriculture; in no part does it so nearly approach the necessary completeness for inclusion in a national plan. It may seem paradoxical to say that this is because in agriculture it has been so difficult to do; but it is nevertheless true. The disadvantages agriculture has suffered and their repercussions on the rest of the economy have gained consent to the gradual growth of a formidable organization for outwitting a whimsical nature as well as a hostile economic system. It is paradoxical too that in the industry which has been slowest to increase in unit-size, the scale of planning for it should be the widest; but that is also true. It is true because markets for staple farm products are nation-wide, because problems are common ones, and because stability depends on general arrangements.

¹ Within the memory of many men still living there have been three such crises: World War I, The Great Depression, and World War II, each of which left a residue of planning institutions.

In accordance with the rule that human beings prefer simplicity, the farmer prefers not to think of himself as the subject of elaborate study and as an object of social management. The farmer, as a matter of fact, of all people in our society, regards himself as the most independent; and economists would doubtless say that agriculture is likely to be the last stronghold of *laissez faire*. Yet—and perhaps partly because of this—the influences which impinge upon American agriculture, aside from those of nature—sun, rain, and wind—are almost all of them by now at least national in scope. Many of them are global.

Farmers may prefer to believe that they decide a good deal for themselves, and actually they may, for the moment, for the short run, but actually most of the issues about which they may regard themselves as free to choose, are decided in places and in ways which are far from local and far from individual. The decisions may be reached by the automatism of the market, since many farm prices come nearer the classical economists' ideal than any others in our economy. Or they may be reached in elaborately arranged processes which are as unlike the market automatism as is possible—such, for instance, as the referenda devised by the Agricultural Adjustment Administration in which national decisions are made regarding production. But in either case, the role of the individual is that of joining in a vast social process. These two choices really represent the farmer's available contemporary alternatives. He may abstain from taking part in the economic democracy of the Department of Agriculture and learn that he has registered an unconscious vote through the market mechanism; or he may decide to participate and become one of many in a vast process of conscious decision-making. In abstaining, he has not abstained; in participating, he has not been so much of an individualist as he has regarded himself as being.

The farmer comes to understand the inescapable socialization of agriculture or he does not; but at least he feels himself more and more caught up in an on-going process. And he either participates in attempts to influence it or he submits to having others do it in his name. This last is not very agreeable from the democratic point of view and the more independent-minded resent it. Yet it is what actually happens. As a result, there has come into this most individualistic of occupations the most elaborate planning known to

our economy, equipped with machinery for all the pre-planning processes and with a bureaucracy which, like all bureaucracies, sometimes conceives itself as having divine rights, but which on the whole has given agriculture a far more secure place in the economy than it would otherwise have. And all this has been in spite of professions by everyone concerned of unshakable loyalty to *laissez faire*.

The most pressing contemporary question is whether, as plans are attenuated and controls relaxed, economic storms will not come again. Planning devices were steadily strengthened during the New Deal and the war years; but many of them were given up at the coming of peace. How serious this will be depends upon the length to which attenuation and relaxation go; but already there are visible dangers. Most of the revulsion from the idea of planning comes from not appreciating its necessary processes. That these are necessarily more democratic—that is based on substantial agreement—than most others of government is not usually realized. They do require machinery and the machinery has to be operated by experts; but they largely consist in regularizing and making effective what is otherwise done but not done as well as is required in society.

How is planning done, for instance, for production? The picture of a farmer sitting down on a winter evening and conjuring out of his inner consciousness a program for his year's operations leaves a good deal out of account, especially in our times. His decisions are apt to be based on elaborate information as to the marketing possibilities of what he intends to produce as well as on what he knows or can learn about production. This information has come to him through a multitude of contacts and from many sources, many of them especially devised as contributions to his decision. These may be interested or disinterested. According to the theory of independence, he makes up his own mind in a welter of conflicting suggestion. Actually he follows occupational advice from sources he has learned to trust—his county agent, or bulletins and periodicals whose sources are known to him. And these are supplemented by special advice on many occasions either when he feels the need of it or when the welfare of agriculture, or even, sometimes, of the economy (in case of war, for instance) requires it. Or perhaps his choice is even more severely limited by not being able

to participate in certain benefits unless he chooses a certain course.

At any rate, behind the guidance a farmer gets these days is a most careful structure of planning, built upon long researches at experiment stations and in the offices and laboratories of economists to the support of which more and more public funds go as we grow more civilized, and these have been narrowed and refined by pre-planners. The web of information grows more complete; it forms a firm, if narrow, support for individual decision. And usually the individual finds it reasonable to lean on it. It needs to be firmer; it needs to be more free from contamination by the interested and the prejudiced; it needs to be more carefully organized. But most farmers do lean on it and they expect others to do so too, thus making a program of action as well as planning.

The organization and institutionalization of such planning requires exploration and examination, over and over, of all information and possibilities, and it means reaching substantial agreement in consultation, in hearings and ultimately in legislative approval, both as to facts and their implications. When, beyond that, the small percentage of mavericks are required to conform it is not a matter of much more importance to individual liberty than the requirement of living according to other laws—such as getting a license for hunting, having herds tested for disease, or conforming to drainage or irrigation regulations in an organized district. Look at it, for instance, as a process for production adjustment. Less wheat and cotton are needed; more hogs and dairy products can be sold profitably. These are facts—if they are facts—which can only be determined by study of world conditions, most elaborate, costly and disinterested study. No farmer could get them for himself; no organization of farmers could get them. And no farmer can arrive at the effect of his decision with respect to them independent of all other decisions which will also be made. It is only possible to approach such a decision as a planned decision, if any adjustment of a favorable sort is to be made.

Planning for Agriculture

The full-flowered operations of the A.A.A. as an operation in planning and social management were, in fact, only possible because of preceding work which had gone on for many years. This is not the place to review the origins and development of the intentions-to-plant program; or to assess its success in adjusting production to

demand.² It must be said, however, that, like so many mild and wholly voluntary measures, it sufficed for fair weather but not for foul. It was intended to prevent surpluses but it could not reduce production to the point which would have been required to maintain parity prices in the years of real crisis. The mere minimum rhythm of agricultural operations, even with reduced capital and scamped labor, produced "surpluses" in those years—more of some products such as wheat and cotton, than of others, but nevertheless actual surpluses.

No one knew better than those who devised and administered the adjustment machinery which superseded the intentions-to-plant system, that the adjustment ought to be up rather than down—that is, that the national consumption ought to be enlarged to consume larger crops. There might still be needed some switching of acreage from one crop to another: there was, for instance, too much cotton and wheat and too little milk and butter. But on the whole, more foods and fibres were needed. Only they could not be sold reasonably. And there came a time when they could not be sold even at prices which involved giving away as a bonus considerable margins of capital. The adjustment downward of production was an emergency measure, one of desperation.³

² The name of W. J. Spillman will forever be associated with the growth of rural social action in America. He began early in the Century to feel his way toward agricultural adjustment and to lay the foundation in research and pre-planning for its later development. By 1918 he had brought the Office of Farm Management in the Department to the point of being the recognizable predecessor to the Bureau of Agricultural Economics and had published cost of production figures so embarrassing to Secretary Houston that he was forced to resign. The work, however, went on. When the action programs of the New Deal began in 1933, there was a firm foundation on which to build. This consisted not only in accumulated relevant knowledge but also in a central staff and a far-reaching field reporting system capable of finding out anything which policy makers needed to know about agriculture.

³ In Mr. Russell Lord's *The Wallaces of Iowa*, (Houghton, Mifflin Co., 1947) there will be found ample evidence that H. A. Wallace, before he became Secretary, and during his term, was aware of the necessity for a different approach than that represented by the early program of A.A.A. In many of his writings for *Wallace's Farmer*, and in many of his public papers, will be found foreshadowings of "balanced abundance," and of the soil conservation approaches to agricultural reform. It is sometimes forgot that a corporation to dispose of surpluses to the needy, rather than prevent their production, was one of the earliest inventions of the Secretary's regime. Its policies were worked out largely by Mr. (now Judge) Jerome Frank and others in the Secretary's group. The author also, before becoming a Department official had foreshadowed more constructive policies in, for instance, "*Farm Relief and a Permanent Agriculture*," *Annals of the American Academy of Political and Social Science*, Vol. CXLII (March 1929), pp. 271-282, as well as other exploratory articles. The sole excuse ever put forward for reduction was that it was necessary in the circumstances. Also, it is usually forgot that the surpluses of wheat and cotton, at least, were absolute surpluses and needed to be reduced in any case.

It was before long replaced by one which made much more sense in principle, and had been in prospect for a long time. To make adjustments which were in the interest of conservation was a considerably higher objective. But even this was not what any conscientious planner would want. He would have in his mind most prominently those famous diet contrasts shown in the home economists' tables and the acreages needed to achieve the highest of them.⁴ And he would say that the objective for which he could work with most enthusiasm would be a full fed and well-clothed nation and an agriculture whose intention it was to supply the materials for such a program. Planners looked morbidly at the high, low and middle diets and wondered at a social system which enforced the low one—which meant malnutrition in various degrees for perhaps a third of the population.

How is collective planning done for individualists? It seems like a contradiction in terms. There was, of course, one way—the way the farmers had always wanted: this was to guarantee a market at a profitable price for everything farmers cared to produce. The difficulty was to figure out what to do with wheat, cotton, and certain other commodities when they had been produced. The direct answer to this was again obvious: to furnish a considerably increased purchasing power to consumers. There would still be too much of some things; but the worst effect of the larger surpluses would be mitigated.

Such a policy as this would involve some drastic modifications of the economic system—so drastic indeed that farmers as voters would not accept them. They would take assistance from the government if it was made palatable; but they preferred to be helped in ways of which they need not be made conscious; and least of all did they want the consumers of their goods to be subsidized at the cost of an unbalanced national budget. Whether, when surpluses had been produced, they were consumed, whether they were dumped abroad—or even dumped in the sea—they preferred not to have to choose.⁵

⁴ "Diets at Four Levels of Nutritive Content and Cost," U. S. Department of Agriculture, Circular 296, p. 31, 1933. For an account of the origin and use of this report see *The Wallaces of Iowa*, op. cit. p. 386.

⁵ It was the dilemma into which planning officials were plunged as a result of this inconsistency which caused Mr. Wallace to write his protesting pamphlet *America Must Choose*. This was published in the Spring of 1934. Thus early, it will be seen, Mr. Wallace felt the pressure of his dilemma. He was required to do the impossible—to solve a problem without the means to do it. "We cannot dream our way into the

The department was expected to arrange for a full-running agriculture, but it must be done invisibly, by some magical process, which not only would be unseen, but would be costless.⁶

Mr. Henry Wallace labored long and hard to reconcile the interests of farmer and consumer, telling each alike that what he wanted was necessary to what the other wanted. A full diet and full farming operations were "part of the picture"—a phrase which meant that there existed a mutual relationship within an organic whole. Full production and full consumption each went a long way toward making the other possible but not the whole way. For the city consumer got his income from commerce and industry: this was the other half of the national economy; and it was the despair of the agricultural planners. For industrialists, although they talked like individualists too, were far more dangerous, as such, than the farmers. They were, many of them, elephantine individualists in a world of rural mice, crashing about with devastating effect in the economic forest.⁷ They might take fright at a mouse underfoot, but even in fright and acting without consideration,

future," he said, "we must be ready to make sacrifices to a known end. As we wrestle with all the known complexities which now beset us, the temptation is to give way to false and easy hopes . . . much as we dislike them, the new types of social control . . . are here to stay and to grow on a world or national scale. We shall have to go on doing all the things we do not want to do. The farmer dislikes production control instinctively. He does not like to see land idle and people hungry."

⁶ This calls up the whole long story of the fight for agricultural "justice." To recount all of it would require going back to the agrarian movements which began as soon as the western settlers acquired debts and found it difficult to pay for them with cheap produce. But the connected forerunners of New Deal action have a long enough history. It involves all the McNary-Haugen agitation, for instance, which was a plan for selling abroad at a lower price than would be maintained on the domestic market. This had many phases. It turned into what was called the domestic allotment plan and was embodied in the measure put before the lameduck Congress of 1932. Then there was the "export debenture" plan, and there were others. The Agricultural Adjustment Act was something of an omnibus bill because of the partisan support for various alternate schemes. In it the Congress simply delegated to the President and the Secretary power to choose whatever scheme seemed best and to put it into action. The differences were thus merely transferred to the administrators who continued to differ. Mr. Peek, the first A. A. A. administrator, believed in export dumping and was made unhappy by the Secretary's insistence on crop reduction. The differences over policy finally became quarrels and Mr. Peek retired. Differences continued; but there was agreement on the necessity for the main action program. And there was substantial support for it among farmers generally. It—or something—raised agricultural income rapidly. And "party" became a realizable objective almost at once.

⁷ A rough estimate indicates that perhaps 85-90 percent of the world's people still live on farms. This is, of course, much higher than the proportion for the United States which is about 20 percent. This is a proportion which is changing rapidly but the change is giving agriculture relatively less rather than more economic power because the average size of industrial operations increases so much more rapidly.

enormous consequences resulted from their smallest decisions.

What the authors of the A.A.A., as an emergency measure, had really done, was to conceive the economy as a dichotomy. They had divided all income into that of agriculture and that of industry and then had tried to make such reductions in agricultural production as would bring the prices of its products into a "parity" (that is a reasonably reciprocal relation) with those of industry.⁸ They hoped to establish a basis for the exchange of the two kinds of products which would be substantially that which had prevailed in "good" times. If they could do that, the balance, once achieved, might assume an upward movement, and the rearticulated economy go forward as a whole. The carefully conceived program, as is so often true, fell into bargaining among economic groups, through a Congress which had no conviction in the general matter and no standard by which to judge, and which responded to the strongest and most immediate pressure no matter what its long-run effect. What resulted was something far from well calculated to achieve the effect. But it was something. Together with President Roosevelt's reluctant simultaneous devaluations of the unit of currency, and both farmers' and consumers' subsidies—by various devices, including work relief, a two price system, and even dumping abroad—a tolerable situation was achieved.

The real difficulty, the basic difficulty, with the program was that it seemed not to be educative so that its elements of reciprocity could become permanent and its inflationary supports be dropped. None of the individualists appeared to realize that his future existence as a functioning part of the economy would thereafter depend upon the maintenance of a calculated relation with the rest of it. All in chorus talked of "getting back to freedom." That kind of freedom had gone from the world forever if it was not to fall into a worse disaster than that from which it had been rescued. But some education was evidently necessary to persuade democrats that this was so. They had demonstrated that they could not learn from experience. They would not tolerate the logical and necessary extension of the institutions they had already accepted.

President Roosevelt had to go on and on with an unbalanced budget, subsidizing the most demanding elements of the economy. He had to go on until W.P.A. merged into war production. It has to

⁸ The preferred word was "balance," but parity had so much more technical correctness that it was finally adopted as the official term indicating reciprocity.

be remembered not only how the emergence from depression was accomplished, but also that there was an almost immediate oncoming of preparations for war. It is often said that it was easy for Hitler to boast of having cured unemployment because he had all the unemployed either in the army or hard at work making munitions. In a way it was forced work paid for by inflation. The same thing was true of the Russians. And to a large extent it was, it must be admitted, true in the United States. An attempt had been made in 1936 to withdraw subsidies and relief spending. The recession of 1937 showed that it could not be done without disaster in an unarticulated economy. It was never tried again; and the gradual rise of war preparations and then production for war itself made it unnecessary.

Lessons from War Years

When the nation really began to work seriously at the business of getting ready for war, there occurred another of those miraculous expansions which, to all those who were old enough to recall the events of 1917, was no surprise. It was proved then that, even with the stimulus of something like a billion-and-a-half of annual subsidies, operations had been no where near the productive potential. Not until then had there been found what was needed to release the binding-cloths which had prevented the growth and expansion which should have come from widespread technical education, vast accumulations of knowledge, discoveries of new materials and processes and the developing science of management. Then the lesson became too plain to miss. The expansion of production which occurred during the war revealed that the system had been operating to withhold as much as to produce.

What made the difference? An assured market; a great general incentive; moderately good planning, fairly effective administration; abandonment of withholding. These were the facilitating minima. But, again, the assured market was financed not so much by balanced mutual exchange among producers as by inflation. Even in the great emergency the self-discipline of mutuality could not be found in sufficient intensity. There was more of it than there had been in peace times; but as the crisis of the war passed, it was rapidly dissipated and there soon set in a competition among various interests to see which could be most effectual in breaking down the structure of articulation and control.

It could be seen by those who cared to learn the lesson that at the enlarged productive rate of 1942-48 the nation could live better than it ever had before and yet devote something between one-third and one-half of its total income to projects for future development—it was war, then, or recovery from war; it could as well have been highways, hospitals, schools, scientific laboratories, houses. It could also be seen that we had been learning to operate the planning agencies. The O.P.A.; the W.P.B., the W.F.A., the O.D.T.; the W.S.B.; the R.F.C. and many similar controlling devices were working better and better; best of all, the stabilizing and central directing offices—the E.O.M., the O.W.M.; the O.E.S. were beginning to be taken for granted and were performing their functions with greater and greater comprehension of their objective—which now lay beyond the victory and was called Reconversion.

In all this agriculture had done and was doing very well. In spite of some vacillation at the top, both in the old Department and in the War Food Administration, it had gone forward into prosperity. There had been recognition of its importance and a disposition to be fair; there also had been gratitude to those who had fed and clothed the armies and now were feeding and clothing the displaced and suffering millions in Europe and even in Asia. Would it have been expected that the agencies of stabilization would have been disestablished? I think not. Yet they were.

It was evident that not much had been learned and that much had been forgot. It was also evident that we were in danger of returning to a situation, once familiar but now happily almost forgot, of idle men, idle factories, great projects not being carried out—the new world, of which we had been given a glimpse, postponed so that a futile struggle for advantage could go on. Depression would be delayed so long as we fed and otherwise supplied a devastated world; but that would not be likely to be long, for the nation was in no very generous mood. President Roosevelt, political genius that he was, had not brought the various parts of the system into a permanent workable balance. He had gone some way; he had become genuinely expert at crisis management; but the know-how had not yet become traditional and institutionalized. And when he had gone, it had at once appeared that, lacking greatly inspired leadership, there was still ample scope for self-interested pressure, and insufficient resistance in the stabilizing machinery. This was a weak-

ness which came from deep down in the democracy among those who had done well in war production, and who controlled local public opinion. Of these there were millions; for they included even workers and farmers. They wanted to go back to what they called "freedom." It was this desire, fundamentally, which made it impossible, when victory had come, to plan or act in the public interest except as it might accidentally emerge from the conflicts among extremely complex interests.

There are those within such a vast bureaucracy as that of the Department of Agriculture who are permitted to devote themselves to the procedures for survey and analysis which are the indispensables of pre-planning. In the course of years they have accumulated an enormous store of relevant knowledge. The various statisticians and economists are sufficiently skilled also in putting all this knowledge together in ways which would be useful if it had a containing framework; and desirable objectives are continually being defined—such, for instance, as the full diet for Americans, or, for other instances, social security for all citizens, or the conservation of farmland and forest resources. Yet something is lacking—more than just something. It is, as a matter of fact, that sense of organism, of *gestalt* without which the nation cannot any long function effectively. It breaks down on analysis into (1) a definition of the relation of agriculture to the economic organism as a whole; (2) machinery for judging current proposals by a development plan; (3) instrumentation in government for the long run and general interest when expediency or private interests run in the contrary direction; and (4) means of requiring conformance on the part of small minorities who refuse to join in general and agreed action

Constitutionality and the Concept of the Whole

These are, of course, matters which have constitutional implications and need exploration in terms appropriate to their legality. But they are also matters of political economy, the assumptions of which are of prior interest. If it is important enough, and sound enough, constitutional change can be argued for; otherwise not. As to this, what is implied is that agriculture cannot be benefited as an interest by itself and at the expense of the rest of the economy. The situation is such that in a contest of pressures agriculture will always be likely to lose. It may not seem so at any given time; and professional lobbyists may so disturb the issues as to convince most

farmers that they can exploit the rest of the community. But it will seldom be true; and, perhaps, never for the long run. The nature of technological advance is such that it will usually be applied first in industry; and the more rapidly progressing parts of a slackly controlled organism will exploit the less rapidly progressing parts. This will be a wholly involuntary result, working out through the automatic or semi-automatic operations of the market place; it will be helped by the family-farm preference, so prevalent in the United States, which will hinder progress toward an efficient scale of operations.⁹ At any rate, within the framework of prevailing preference, the farmers' only defense is to get countervailing subsidies from a Congress which happens currently to be sensitive to agricultural interests, but which may well gradually cease to be as the proportion of farmers in the whole population declines, as industry disperses itself into what are now almost exclusively rural regions, and as the disproportion of scale and progress in efficiency becomes more exaggerated. The farm-bloc which has been so powerful in recent years may fall apart in the future from the attenuation of its constituency.

The farmers' real hope, it may be predicted, will prove to lie in developing a concept of the general interest and in perfecting machinery for maintaining the integrity of all the parts of a balanced whole. Intimations of such a concept were implied in the parity-price provisions of the successive A.A.A. acts and in such a word as "parity." Parity implied a condition of well-being for others than farmers.

Balance implies a near-organic concept of the economy. It carries with it the suggestion of indispensable central planning: the governmental machinery for making decisions concerning policy so that results will accord with what has been worked out and agreed on. This does not necessarily imply an independent Central Planning Agency. Such an agency might be called anything and might be dispersed in almost unrecognizable pieces throughout the government. But the essentials would have to exist: a way of getting an approved plan and a way of protecting its integrity against caprice and selfishness no matter under what attractive guises these betraying interests presented themselves and no matter where they might originate.

⁹ Perhaps not so greatly as some theorists argue, because, in spite of resistance, a consolidation movement goes on. As in other industries, management problems become more complex, and the better managers extend their holdings.

Constitutionally—regarding the constitution less as a legal instrument than as a court-created tradition—the difficulties of recognizing the American economy as an articulated whole are considerable but not absolute. It has to be recalled what position the Courts are in when there is so little recognition elsewhere of essential economic and social unity. It has to be recalled that there are not many even yet who recognize that a national organism without an institutional mind or higher nerve centers is a kind of horrible Frankensteinian monster whose casual and brutal wallowings will certainly create catastrophe.

The guess may be hazarded that people in this democracy simply have not yet made the connection between their fears and the source of them—or for that matter between their hopes, such as they possess, and a firm and understood program for achieving them. They are therefore open to persuasion that men who want balance are “crackpots.” This is a strange paradox and can only be understood by knowing the elementary state of our information in such matters. The schools do not teach, and organs of opinion do not insist, that we must achieve organic relations among the elements of the economy and provide ways of preventing any part of the whole from exploiting the other parts. That such exploitation returns to torment even its authors, is a lesson which seems to have lain plainly in the events of the “twenties” and “thirties”; but there has been a kind of determined refusal to draw the lesson—which again can only be understood by remembering what its acceptance would imply. This, of course, is a willingness on the part of each to subordinate his own initiative in the functioning of the whole. That he would have had a part in creating the development plan in democratic fashion and that the machinery for operating it would be strictly impersonal, has not penetrated public consciousness or, at least, has not offset the intense concentration on the pursuit of private objectives. Workers and farmers, as well as most business men, oppose the least suggestion of the only kind of public policy which can lead to stability. They could only be brought to modify the dangerous disparity between such an end and the means which might achieve it, by the systematic and prolonged insistence of those whose duty it is to explain such matters. The obligations of leadership seem to have been singularly neglected in this respect.

The constitutional reversal cannot possibly precede and obviously must follow at some length reversal of public feeling in such a fundamental matter. It is true that there have been gains and

that there are clear evidences of vision in the Courts. That these gains should run, as yet, to a concept of the nation as an organic whole would not be expected.¹⁰ Positive guidance of certain elements of the economy is already fact; and agriculture shares prominently in the gains from this guidance. But this, again, is not a recognition that public welfare cannot be achieved except by the subordination of each special interest to that of a larger whole. It is, perhaps, not so very far from such a recognition, at least not so far that it cannot be predicted that full recognition would come from the courts if it should be generally demanded. That there should be demanded a social progress in which the interests of each were merged in those of all is prerequisite. The courts cannot go faster than is demanded.

What the planner sees is thus limited by his apprehensions. He must continue to believe that the weaker interests in the economy will suffer first and most seriously; and that this will be followed by general paralysis as the results of this suffering spread to other parts of the organism. There is no reason for not anticipating that the weakest interest will not again be agriculture as it was in the "twenties", and that a general depression will not follow an agricultural deflation.

*Planning Under the Hope-Flannagan Bill*¹¹

The planner must also be apprehensive about time. The saying among government economists that "America had been priced out of a boom," which became current as the results of abandoning price controls became apparent in 1947, indicated a similar fear about time. Each rise in price reduced the reservoir of savings which had been counted on to carry the economy into "normalcy." A characteristic of these changes was a competition for price position which at once attained frightening intensity. The government's agencies seemed to assume the character of means for gaining private advantage rather than that of mechanisms for maintaining stability.

All this pleased so many of those who held positions of leadership that it seemed quite clearly to be a movement back to what

¹⁰ Yet current interpretations of the Commerce Clause might easily be imagined to be based on some such conception.

¹¹ Public Law 738, 79th Congress, Chap. 966, 2nd Session. The *Hearings* on which this discussion is based are those of 13 June to 26 June 1946, before the House Committee on Agriculture on H.R. 6932.

was a generally approved pre New Deal system of social arrangements. Because of the concertedness of this movement and its accelerating momentum, the planner, who must think in terms of his technique—the development plan and the subordination to it of individual initiatives—as a way of gaining stability, could hardly consider lesser problems.

Planning for agriculture, when it developed a comprehensible shape during New Deal days, consisted largely of showing how and on what terms reciprocal relations with other great functioning divisions of the social economy might be established—notably, industry. This was inevitable in so great an emergency as then existed. This parity was identified as the relationship which *had* existed at a time (1909–14) when agriculture had at least not been depressed, had not been a drag on the whole economy, had even been making some progress. The first A.A.A. was an action program for establishing parity according to plan. The second A.A.A. introduced the idea of conservation—that is, parity gained through or at least with—conservation. The other large ideas devised by the planners were those of the ever-normal granary, and means for disposing of surpluses without reducing production beyond an essential minimum (these took various forms, as diverse as free distribution to the indigent and expansion of industrial uses for farm products). These devices about used up what accumulated agreement existed and could be translated into action. It was thought that they did at least furnish protection against the worst possibilities of the future, a kind of minimum for agriculture in an uncertain world.

Yet there was great uneasiness; and probably no one was satisfied that either stabilization or progress had been assured by the institutions brought into being with so much effort. And the pressure groups operating upon the Congress showed very clearly how deep this uneasiness ran: they demanded more and more rigid protections. They sought to redefine parity—upwards, of course. They sought to establish minimum guaranteed prices by means of commodity loans. They sought to have exports subsidized. But also, they sought to enlarge research.¹² And this might well be thought to be the most significant development of all. For through it agriculture might find new ways to improve and to defend itself from insecurity.

¹² Most formally in the Bankhead-Jones Bill which became law in June, 1935 to which the Hope-Flannagan Bill of August, 1946 is an amendment

It was, it must be noted, always called "research" and not "planning."¹³ On research, however, there was placed a limitation. It had to be directed toward the assistance of private enterprise. It was, in fact, roundly stated that "Congress hereby declares that a sound, efficient, and *privately operated system*, for distributing and marketing agricultural products is essential. . . ." The fact that the Hope-Flannagan Bill, which would extend the research begun in New Deal days should be so insistent on private enterprise in distribution would seem to isolate a prospectively fruitful field for exploration and label it "untouchable." Yet "private" includes cooperatives. So it must have been intended merely to exclude government ownership or operation. This was, it may be guessed, not only in response to pressures of private and cooperative processors and distributors, but also an expression of genuine concern. But it is a limitation which ought not to have been imposed if genuinely free research was to be encouraged. Research in Russia—whose conceptual direction of research we condemn—must be similarly limited. A Russian Hope-Flannagan Bill would doubtless condition its terms to include *only* public ownership and operation.

We are, in other words, not yet ready for wholly honest research in marketing—only such research as will confirm, or at least be limited by a general concept of the economy, a particular view of what is the proper conduct of economic life.

If we, without prejudice, look at the possible ways of improving agriculture's position in the economy so far as they can be seen by drawing on knowledge general in the community, the possible improvements in production are undoubtedly the most obvious. Production has been the subject of immense efforts in the past and will be the subject of greater ones in the future. At its furthest imaginable and most fantastic advance it might reduce farming to a marginal or avocational occupation: once in a while some such suggestion is made. Synthetic foods and fibres have not yet made significant inroads on the farmer's province, but their development is something not impossible in the light of what is already known to science, and actually some of them are already in use. Short of

¹³ A certain percentage was reserved for research in "marketing." What the distinctions are here is not at all clear. Does research in marketing mean merely the discovery of more marketable forms for farm products, better physical ways of getting them to the consumer, and more agreeable services in connection with them? Or does it include examination of the whole middle-man complex to establish low cost distribution?

that, perhaps meanwhile, genetic, chemical, pathological, and ecological researches are certain to be greatly advanced just by extension of present activities. And so are the enormous contributions of engineering. There are no items in this list which may not be forwarded within the terms allowed by funds now available or to be made available. And continued progress may be expected.

More progress has been made in these matters, by far, than in the adjustments to them which must be made by social organisms, institutions, customs, laws, and prejudices. There is even a reluctance, amounting almost to tacit conspiracy, to prevent the necessary exploration of these matters.¹⁴ Unless this range of subjects be defined as "marketing," or as "utilization" the categories recognized in the Bankhead-Jones and the Hope-Flannagan bills, it would appear to be entirely exempted from exploration. Yet it would seem to hold great promise.

When one goes back to the purpose of agriculture in society, it must be defined quite simply as the production of food and fibres for the community. To this we have been inclined to add, as civilization has grown, a duty to conserve the productive elements, soil and water. There has been a tendency to build on this rather simple responsibility a rather elaborate structure of rationalization—easily traced to the antiquity of the occupation, its "primary" nature and so on. This rationalization would set farming apart as something more than a producing and conserving occupation, as in fact, a way of life. This easily expands into a theory of protection for its qualities and relief from its disadvantages, if necessary at the expense of the rest of the community. The family farm becomes more than a producing unit, and tendencies which would weaken it become antisocial. Ownership becomes an absolute good; and any threat to it something to be combatted vigorously.

Research into matters which are beyond rationalization is prevented as a matter of course if it is at all possible. And even when forces at work are so universal and powerful that trends persist in

¹⁴ This is an old theme with the author of this paper. For instance, in an address to the General Assembly of the Institute of Agriculture in Rome in 1935, he said, "The long and unspectacular growth of productive technique has transformed the world under our unseeing eyes. We now have to find the social and political adjustments which are appropriate to it." And even before that—a decade before—he had written a book, *Industry's Coming of Age*, whose purpose was to persuade economists that a restudy of their concepts had been made necessary by the transformation of agricultural and industrial techniques.

spite of efforts to reverse them, the concealment and blindness continue. Without laboring this point, it is not hard to see that a detached observer would be able to point out areas for exploration in these fields which might be extremely important. Of course, many of the facts are and have been for some time available; but there have been few attempts to set up and assess alternatives.

It is by extension of the rationalization concerning farming as an owner-operator enterprise that marketing is conceived as a private occupation. Yet there is not the same certainty in this extension. It was not felt necessary to say that government should keep out of farming. But it was felt necessary to forbid research which looked in any such direction. This may have been the result of private processor influence on legislation, but it would find sympathies already prepared among Congressmen whose farmer constituents, however much their livelihood might depend on government interferences, maintain the fantasy that they are the economy's only remaining unreconstructed individualists.

It is not necessary to suggest that agriculturists would not make a similar suggestion or entertain similar prejudices about other occupations. Has not the farmer been the traditional prime mover for the regulation of railroads, stock yards, seed concerns, produce exchanges, oil and power companies, "Wall Street"—in fact, most of the other activities which touch farmers in any way? It would be naive to suggest that this difference indicates a feeling of inferiority. It is much more sensible to suppose that it rests on an assumption of superiority; a feeling that agriculture ought to have everything else regulated in its interest. It is a familiar impulse which wants all other interests regulated except ones own so that the single free factor in the economy may maintain an advantageous position. That the farmer has not gained much from this attitude might be argued, if it was known what his situation might otherwise have been, or what it might still be with a drastically changed structure of ownership, operation and regulation.

No other field is so completely unexplored. Its immense possibilities may not be of interest to any individual farmer or any other specific agricultural interest; yet they certainly are of interest to the whole economy and even to agriculture in the economy. Suggestion for such explorations is often taken as hostility to agriculture. Of course it is not. It is merely hostility to those who would keep agriculture and the economy shackled to prejudice and who

would rather have no progress than progress which does not conform to their preconceptions.

Chancellor Hutchins, on taking a year's leave from the University of Chicago, recently, to devote himself to adult education, reported to have explained that there was not time enough left for the education of youth. The only hope left, he was said to have indicated, was that of changing the minds of those who were already responsible and influential citizens. The planner must also feel this same urgency as fate-laden events tumble upon one another. He must be more and more appalled that in a civilization so certainly doomed unless separatism, exclusiveness, and reaction can be drastically modified there should be such determined clinging to privileged positions and vested concepts. He must feel that now, of all times in man's history, intelligences need to be freed for exploration and experiment.

President Conant of Harvard in the Spring of 1947 had some very harsh things to say about the backwardness of the social sciences in comparison with the natural sciences. He intimated that the lack of progress might well force the natural scientists to develop the social fields. If there is wonder at this deficiency, examination of the conditions attached to the Hope-Flannagan bill may provide an explanation. Natural science has not, since its nineteenth century struggles with religious orthodoxy, had such handicaps of prejudice to overcome. The planner, like other social scientists, may not have great hope of modification in these attitudes and the attainment of freedom in time to avert clamity; but he must be forgiven for insisting that materials are being played with which are likely to destroy the world unless they are made to conform to civilized disciplines.

PLANNING UNDER THE RESEARCH AND MARKETING ACT OF 1946; A STUDY IN THE SOCIOLOGY OF KNOWLEDGE

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WITH the Research and Marketing Act of 1946¹ Congress provided the statutory basis for a greatly expanded program of research in the natural and social sciences. Plainly the questions that are asked in this program of research will largely determine the answers that are found.² Plainly, too, there is no purely objective basis upon which the questions can be formulated—no basis, that is, apart from the interests and motives of human beings. It should be worthwhile, therefore, to inquire into the interests and motives that are controlling in the selection of problems for study under the Act. How do some questions (and not others seemingly as pertinent) happen to be asked at this particular time? What value premises (biases) are implicit in the questions? Are the questions congruent with the realities of the situation toward which they are directed? Are they congruent with the nature of science? Inquiry along these lines in the manner of the sociology of knowledge³ should help us understand what may be expected of the Research and Marketing Program. Beyond that, as a case-study of an area of social activity which one might expect to find characterized by a relatively high degree of rationality, the inquiry should shed some useful light on the tasks that face the social planner.

This paper is in three parts. The first summarizes the terms of the Act, the planning procedure followed under it, and the research and marketing program formulated for the fiscal year 1948. Because of space limitations, this section is much condensed; it is assumed that readers of this JOURNAL have easy access to other descriptive material.⁴ The second part of the paper describes the

* The author wishes to acknowledge the help he has received from Louis Wirth's lectures on the Sociology of Knowledge and from Charles M. Hardin's criticism of an earlier draft of this paper.

¹ Public Law 733, 79th Cong., 2nd Sess.

² This is true although the role of accident in research in the physical sciences is very great.

³ The awkward term "sociology of knowledge" is a translation of the German *Wissenssoziologie*; it means the study of knowledge in its societal setting. The formulation used here is that of Karl Mannheim in *Ideology and Utopia* (Wirth and Shils translation) New York 1946.

⁴ See the statement by the Administrator of the Act in this JOURNAL, 29: 4 (Nov.

social forces and the events which culminated in the Act and the research program for 1948. Here it will be assumed that the reader has read Charles M. Hardin's article on political influences and agricultural research.⁵ The final part appraises the ideology that is revealed and considers the underlying problem—how to formulate an agricultural research program which is congruent with reality—in the light of the sociology of knowledge.

I

The purpose of the Act is very broad; it is (in the general title) "to provide for further research into basic laws and principles relating to agriculture and to improve and facilitate the marketing and distribution of agricultural products." This general language is so qualified in the body of the Act, however, as to create four quite distinct programs:

PROGRAM 1. (Title 1, Sec. 9) *Subject matter*: basic laws and principles relating to agriculture in its broadest aspects, but not less than 20% of appropriations must be used for projects in the field of marketing. *Agency*: State Experiment Stations, but not more than 25% of the appropriation may be allocated to a Regional Research Fund for use on projects in which two or more Stations are cooperating.

PROGRAM 2. (Title 1, Sec. 10a) *Subject matter*: utilization only. *Agency*: USDA in its own laboratories or by contract from USDA to public or private agencies.

PROGRAM 3. (Title 1, Sec. 10b) *Subject matter*: basic laws and principles other than utilization. *Agency*: USDA in cooperation with Experiment Stations or other agencies if Stations concerned approve.

PROGRAM 4. (Title 2) *Subject matter*: marketing research and services. *Agency*: USDA or USDA with public agencies (including State departments of agriculture) and private agencies or organizations by contract or grant.

The amounts authorized for appropriation in the Act and the amounts actually appropriated for the fiscal years 1948 and 1949 are shown in the table at the top of the next page.

Other noteworthy features of the Act include: 1. USDA may not carry over appropriated funds from year to year (although it may let contracts running for four years), 2. All research must be on "new" projects; funds may not be used to expand projects already

1947) and especially *The Agricultural Research and Marketing Act*, Special Report No. 19 (April, 1948) by the Agriculture Committee on National Policy of the National Planning Association.

⁵ "Political Influence and Agricultural Research," *The American Political Science Review*, 36: 4 (August 1947), pp. 668-686.

APPROPRIATIONS (in millions of dollars)

Program	Actual		Authorized					
	1948	1949	1947	1948	1949	1950	1951	After 1951
1	2 5	3 25	2.5	5 0	10 0	15 0	20 0	*
2	3 0	3.90	3 0	6 0	9 0	12 0	15 0	*
3	1.5	1.95	1 5	3 0	4 5	6.0	*	*
4	2 0	4.75	2 5	5 0	10 0	15 0	20.0	*
Total	9.0	13 85	9.5	19 0	33 5	48 0	61.0*	*

* In amounts as necessary.

under way, 3. A committee of nine elected by the Experiment Station directors and approved by the Secretary must approve all regional projects in Program 1, 4. The Secretary is directed to establish a national advisory committee of eleven members, six of whom shall represent producers or their organizations. The Secretary may establish other appropriate committees, including representatives of producers, industry, government, and science.

The Act was signed by the president in August 1946. Two months later Secretary Anderson appointed the following National Advisory Committee:

Fred Bailey, Washington, D. C., Legislative Consultant to the National Grange.

Robert R. Coker, Hartsville, S. C., Vice-President of Coker's Pedigreed Seed Company; officer of banking, mercantile, and cottonseed oil firms. Member of the Board of Directors, National Cotton Council.

John H. Davis, Washington, D. C., Executive Secretary of the National Council of Farmers Cooperatives.

C. W. Kitchen, Washington, D. C., Executive Vice-President of the United Fresh Fruit and Vegetable Association.

Albert K. Mitchell, Bell Ranch, N. Mex., Manager of the Bell Ranch. Walter L. Randolph, Fayette, Ala., president of the Alabama Farm Bureau Federation and a director of the National Cotton Council.

H. J. Reed, West Lafayette, Ind., Dean and Director of the Purdue University School of Agriculture and Director of the Experiment Station and Agricultural Extension.

W. Kerr Scott, Raleigh, N. C., State Commissioner of Agriculture and a former county agricultural agent and recently elected Governor of North Carolina.

H. E. Babcock, Ithaca, N. Y., agricultural writer and chairman of the Board of Trustees of Cornell University; member of the Board of Governors of the National Farm Chemurgic Council, Inc.

James S. Patton, Denver, Colo., president of the National Farmers Union.

Charles F. Kettering,⁶ Dayton, Ohio, general manager of the Research Laboratory Division of General Motors Corporation and member of the Board of Governors of the National Farm Chemurgic Council Inc.

After consultation with this committee, Secretary Anderson named E. A. Meyer administrator of the Act.⁷ Mr. Meyer is in full charge of all of the Department's marketing activities and is responsible for the "general direction" of research in natural and social science under the Act.⁸

On the recommendation of the National Advisory Committee, Mr. Meyer at the end of 1946 asked some 250 "national producer and commodity organizations" to nominate "broad-gauge public spirited citizens thoroughly conversant with the operation and problems of the industry each represents"⁹ for membership on about 20 commodity committees. These committees were given four functions. 1. to present problems for research and service; 2. to recommend fields of work and their relative importance; 3. to review progress under the Act; and 4. to assist in securing cooperation and understanding of the program by producers and others.¹⁰ The committeemen were chosen "from industry leaders at the executive level"¹¹ and from producers' cooperatives, quasi-cooperatives, pseudo-cooperatives and farm organizations. Except for some Land-Grant College officials, few if any of the committeemen could be called representatives of science or government.¹² At the

⁶ Early in 1948 Frank B. Jewett, vice-president in charge of development and research for the American Telephone and Telegraph Company, replaced Mr. Kettering.

⁷ A graduate of Goshen college, Mr. Meyer was employed from 1921 to 1941 by a large Eastern concern in various positions from office-boy to executive vice-president and general sales manager. During the war he was assistant chief of the WPB's food division and later assistant administrator of PMA. (USDA Press Release 2412-47, Oct. 21, 1947.)

⁸ Secretary's Memorandum No. 1199, July 18, 1947.

⁹ USDA Press Release 2771-46, Dec. 24, 1946.

¹⁰ Memorandum by E. A. Meyer, Dec. 30, 1947.

¹¹ This phrase is the National Cotton Council's Cf its *Ninth Annual Report of Activities*, Jan. 1, 1948, p. 48.

¹² The membership of the committees is given in *House Hearings on the Agriculture Department Appropriations Bill, 1949*, Part 1, pp. 314-317 (This volume is cited hereafter as: *Approp. Hearings*).

The dairy advisory committee, which is reasonably representative of the others in composition, is as follows: R. W. Blackburn, Safeway Stores, Los Angeles, Paul F. Sharp, Golden State Company, Ltd., San Francisco, C. W. Earle, producer, Rayville, La.; Frank W. White, Marshall, Minn., Frank D. Stone, Land O'Lakes Creameries, Inc.; E. W. Gaumnitz, National Cheese Institute, Chicago; A. H. Laut-

same time "working groups" of technicians were created within the Department to advise the commodity committees and to act as liaison between the committees and the interested bureaus; the members of the working groups were given no administrative responsibility in connection with the selection of problems for research.¹³ An "advisory group" of 10 bureau chiefs was appointed "to cooperate in the formation of over-all policy."¹⁴

The working of this administrative machinery has been described by Mr. Meyer as follows:

"Let us use the development of a program on potatoes as an example. My assistant, who has charge of the fruit and vegetable field, asks the representatives of the departmental agencies that are interested in potatoes and who have been appointed as a 'departmental working group' on potatoes to develop an outline of the general problems and make whatever suggestions they have as to work they think should be done concerning potatoes.

"They bring together an outline of these problem areas for consideration by the potato committee. This committee (illustrating on a chart) that I mentioned as representing producers, industry, government, and science. That outline is mimeographed in a little pamphlet form. It runs anywhere from 15 to 35 pages and is sent to the committee members 10 days or more before they come to Washington.

"When this committee comes to Washington, these departmental people meet with them part of the time, and part of the time the committee meets in executive session.

"We ask the committee three questions: With the money under the Research and Marketing Act that may be available for potatoes, what do you recommend it to be spent for; that is, in your opinion, what are the most urgent problems? Then we ask them their opinion as to the relative importance of each, a sort of priority listing, so that if there is only so much money, and we know there will be more requests than there are funds, we want their priority recommendations.

erback, Pure Milk Association, Chicago; Marion Moore, Indiana Condensed Milk Co.; Ken E. Geyer, Connecticut Milk Producers' Association; Dr. T. G. Stitts, H. P. Hood & Sons, Boston; and L. F. Fried, Mid-South Milk Producers Association, Memphis.

¹³ Memorandum by E. A. Meyer, March 4, 1948.

¹⁴ USDA Press Release 1966-47-4, Aug. 29, 1947 and Secretary's Memorandum No. 1199, July 18, 1947.

"This committee after meeting and considering the problems leaves with us in written form a statement of their recommendations.

"These recommendations are presented first to the departmental advisory group which is made up of the heads of all the departmental agencies participating in the program and which advises me concerning the administrative feasibility of implementing the committees' recommendations, concerning methods of accomplishing the desired results, of coordinating them with existing work, and so on. These recommendations are then presented to the 11-man National Advisory Committee. This committee reviews the recommendations of the various commodity and functional committees and advises the Secretary and the Administrator of important over-all considerations in the development of a balanced general program of action.

"From here on the recommendations of the various committees are considered as to the manner in which they fit into the over-all program pattern.

"Then the Administrator after the general program is worked out, approves work in particular fields and notifies the appropriate agency to work out the details of operations and to present specific project proposals in line with the funds the Administrator indicates will be available for that particular activity.

"When these proposed projects come back to the Administrator's office, it is my responsibility to see that all of the projects that are in the field of economic research are cleared with BAE. All of the projects that are not in the field of economics are cleared with ARA. . . .

"Then the Administrator approves the project, notifies the agency to get the project underway, and allots money through the Office of Budget and Finance. The National Advisory Committee and the respective commodity functional committee are notified, and we have been informing the public through a press release of project approvals."¹⁵

More than 90 percent of the 1948 funds were allocated on the basis of recommendations made by the advisory committees, Mr. Meyer told the House subcommittee.¹⁶ This statement of course applied only to funds administered by the Department. Funds

¹⁵ *Approp. Hearings*, pp. 307-308.

¹⁶ *Ibid.*, p. 526. Cf. also p. 305.

granted to the State Experiment Stations are administered under procedures varying somewhat from state to state. In general, however, it may be said that the Experiment Station directors are responsive to pressures from organized agricultural and other interests and are limited by restrictions imposed by the state legislatures.¹⁷

The Regional Research Fund (see Program 1) is administered by a committee of nine experiment station directors.¹⁸ Only those project proposals which are approved by all stations within a region are forwarded to the Regional Committee for consideration. Thus, a project of particular interest to the South, for example, would not be considered unless *all* Southern stations approved of it in advance.

The terms of the Act and the policy of administration resulted in the following allocations by the Department for fiscal 1948.¹⁹

Program 2. (Utilization Research)

a) Developing new and improved uses for agricultural commodities	\$2,297,500
b) Improving human nutrition and extending food uses of agricultural commodities	175,000
c) Preservation and improvement of quality and prevention of spoilage between producer and consumer	437,500
Administration	90,000
Total	3,000,000

Program 3 (Research other than Utilization)

a) Developing new and more profitable uses of resources	538,000
b) Reducing risks in production	412,000
c) More efficient use of farm buildings, houses, machinery and power	280,000
d) Improving the marketing of agricultural products	225,000
e) Improving rural homes and rural life	45,000
Administration	45,000
Total	1,500,000

¹⁷ For the Experiment Station directors' own accounts of these pressures see House Committee on Agriculture, 79th Cong 2nd Sess, Serial M, *Hearings on Agricultural Research*, 1946, pp. 54-66. Regarding the influences of state legislatures, the head of the Office of Experiment Stations has testified (*Approp Hearings*, p 608): "State funds are always earmarked, with perhaps a few exceptions" therefore Federal money "is by far the best money" the stations have.

¹⁸ The membership of the committee is given in *Approp Hearings*, p. 313.

¹⁹ Adapted from *Approp Hearings*, pp 323-324. No similar breakdown of the uses to which Experiment Station funds (Program 1) were put is available. Of the \$2,500,000 appropriated for Program 1, \$1,800,000 was granted directly to the states, \$625,000 was made available to the Regional Research Fund, and \$75,000 was allo-

Program 4 Marketing Research and Services)

a) Developing new market information and basic data ..	276,000
b) Developing new and expanded market outlets .	419,300
c) Reducing marketing costs and margins	185,000
d) Developing new standards and grading to improve marketability of farm products	206,500
e) Improving marketing methods, facilities, and equip- ment	401,200
f) Developing new processing and packaging techniques	226,000
g) Analyses of demand and consumer preferences. . . .	205,500
Administration	80,000
Total	2,000,000

Most of the Program 2 (utilization) research was in natural sciences. Of the \$3,000,000 available, \$1,883,900 was administered by the Bureau of Agricultural and Industrial Chemistry.²⁰ More than one-fifth of the total (\$634,500) was devoted to research on cotton utilization. A fairly representative utilization project was officially described as follows:

"To evaluate various commercial methods of processing grains into industrial alcohol and other products, as well as new methods under consideration in industrial plants to determine the economic practicability of large-scale diversions of surplus and low-grade supplies of grain into alcohol products; to examine the economic soundness of such diversions as a basis for programs to stabilize demand for and prices of food and feed grains by providing more flexible market outlets for low-grade, damaged, and surplus supplies; and to promote the integration of such programs with Government price-support and supply stabilization measures."²¹

Most of the work on Program 3 (research other than utilization) was also done by natural scientists but the Bureau of Agricultural Economics got \$245,000 and the Production and Marketing Administration got \$64,550; most of the BAE and PMA funds were used for marketing studies—this although Program 4 funds were ear-marked solely for marketing, although about 40% of the Program 1 funds were being used for marketing, and although nothing

cated to the Office of Experiment Stations for administration. The Act required that at least 20% of the total appropriated for Program 1 be used for marketing research; actually about 40% was used for this purpose. Cf. USDA Press Release 465-48, March 3, 1948. The allocations to the Experiment Stations are given by state in *Approp. Hearings*, pp. 337-388.

²⁰ The allocations by agencies are given in *Approp. Hearings*, p. 330.

²¹ *Approp. Hearings*, pp. 324-325.

would remain for Program 3 studies on the item "improving rural homes and rural life." The decision to give marketing studies such heavy emphasis was on the recommendation of the National Advisory Committee.²²

An example of the work (presumably "service" not "research") done under Program 4 has been given by C. W. Kitchen, executive vice-president of the United Fresh Fruit and Vegetable Association and a member of the National Advisory Committee. Explaining the use to which his association put a \$50,000 grant, Mr. Kitchen said.²³

"So, what we do under a contract with the Department is this. We go into a city and a wholesaler will provide a classroom. He will provide display racks such as you will find in a retail store. He will provide the produce that can be used, and then the retailers are invited to come to that place in small groups of 8, 10, or 12, and we keep the groups small purposely so that each man will get personal attention. They spend the entire day going through each step, from the preparation of these commodities for display to the building of a display, the care of them during the day and overnight, keeping all the records, pricing and all of the steps which are involved in a retailer operating a produce department in a retail store. And I think you would be amazed at the results of this work. Some show increases of 25, 30, 40, and 50 percent in the volume of sales above what they had been getting; some of them report increases as much as 200 percent. We have put 800 through these courses since November 1."

It is of course impossible to itemize what was *not* provided for in the program for 1948. Nevertheless the directions that were taken cannot be appraised without some reference to others that might have been taken. Some of the choices were explicit: the planners deliberately emphasized utilization research at the expense of production research and omitted entirely what might be termed "welfare" research. These choices were made at the level of consciousness; other choices, perhaps, were made somewhere below that level, in the realm of the taken-for-granted. Certainly it is noteworthy that the whole complex of issues and problems raised by

²² USDA Press Release 1688-47, July 24, 1947.

²³ *Approp. Hearings*, p. 539.

Sir John Boyd-Orr's statement, "It is not the atomic bomb but the food crisis that may destroy us",²⁴ or, in still another very large sphere, by T. W. Schultz' question, "How efficient is American agriculture?"²⁵ should be beyond the planners' range of awareness or interest.

To understand why the planners' apperception mass exhibited one contour rather than another it is necessary to turn now to social forces in the background.

II

When the House Committee on Agriculture began its hearings on research in June 1946 there were two important bills before it. One (H.R. 6548) was introduced by the chairman of the Committee, John W. Flannagan of Virginia, and the other (H.R. 6692) by the ranking minority member, Clifford R. Hope of Kansas. During the hearings these two bills were merged to become titles one and two respectively of H R. 6932, which became the Research and Marketing Act.

The genesis of the two original bills, one coming from the Democratic and the other from the Republican leadership, lay in quite different circumstances.

All but two of the Democratic majority on the Agriculture Committee were from Southern states. The majority was therefore concerned with cotton. The Chairman, Mr. Flannagan, was concerned with cotton but particularly with tobacco. Both cotton and tobacco had been chronically in surplus and their post-war prospect was extremely poor.

In 1944 the then chairman of the Committee had appointed a subcommittee under Representative Stephen Pace of Georgia to study the post-war position of cotton. At Mr. Pace's request, the National Cotton Council, an organization of cotton growers, ginners, merchants, warehousemen, spinners, and cottonseed crushers formed in 1938 to promote the use of cotton, sponsored a meeting of persons interested in cotton research. At this meeting, held in Memphis in May 1945, "an adequate long-term program of research on the production and utilization of cotton was accepted as a basic

²⁴ *New York Times*, May 19, 1948.

²⁵ This JOURNAL, 29: 3 (August 1947), pp. 644-658.

and essential feature of any real solution of the cotton problem. . . ."²⁶

Research on cotton had not figured in a plan which the Bureau of Agricultural Economics had lately developed for the Pace subcommittee's consideration.²⁷ The BAE plan, which was also intended as a real solution of the cotton problem, proposed that the price of cotton be allowed to fall to world levels and that, for a period of five years while cotton growers were reorganizing their enterprises according to a planned diversification, farmers be paid a direct subsidy which would be less each year and finally taper off altogether. This plan was not popular with the leaders of the National Cotton Council, and, with other causes, it resulted in a severe curtailment of BAE at the hands of Congress.²⁸

Following the meeting at Memphis, the National Cotton Council and the Southern experiment station directors, with the advice of the U. S. Department of Agriculture, the farm organizations and other interested parties, drafted a bill which, after it had been expanded "with the cooperation and guidance of Land-Grant colleges and farm organizations representing every part of America" to include not merely cotton but all agricultural products, became H. R. 6548.²⁹

Representative Hope's bill to provide marketing research and services arose out of his belief that marketing improvements might make "action programs" unnecessary. "A lot of us would like to see it (the surplus problem) handled in such a way that the Government would not be in it," Mr. Hope explained during the hearings,³⁰—"that it be worked out through research, that new uses, new purposes, and new methods of marketing be developed with the result that we absorb these extra products." This view was shared by other Mid-western farm leaders. "Research offers the only possibility we can see for cutting down the necessity of expenditures for action programs . . .," the National Grange declared.³¹

²⁶ Walter L. Randolph, a director of the National Cotton Council, in *Agricultural Research*, Serial M, House Committee on Agriculture, 79th Congress, 2nd Session, 1946, p. 105.

²⁷ *A Conversion Program for the Cotton South*, (mimeo'd), Washington: 1945.

²⁸ Cf. Charles M. Hardin, "The Bureau of Agricultural Economics Under Fire," *this JOURNAL*, 28: 3 (August, 1946), pp. 635-668.

²⁹ Walter L. Randolph, *op cit.*, p. 106.

³⁰ *Agricultural Research*, *op cit.*, pp. 198-199.

³¹ This statement was made after the passage of the Act, *Senate Hearings on Agriculture Department Appropriations Bill*, 1948, p. 752.

The bill got ardent support from some who were moved by quite different hopes and fears. The processors and distributors of foods, particularly the United Fresh Fruit and Vegetable Association,³² were anxious to establish closer ties with the Department. Likewise the National Association of Commissioners, Secretaries, and Directors of Agriculture (the members of which are "keenly aware of all political implications as they affect the general economy")³³ supported the bill because its marketing features would expand their functions. Their representative W. Kerr Scott, commissioner of agriculture for North Carolina, explained the background.

"There was introduced several years ago a bill known as the Bailey Bill, and that asked for funds for marketing in the various departments of agriculture. The land-grant (colleges), the Extension Service, the research people, together with the Farm Bureau, jumped on that bill and killed it for the simple reason that they said it did not include them in the program.

"So, we said all right, we are not trying to keep you out of the program. So, the Cooley-Bailey bill was introduced and for some reason or another they killed it, saying they were not properly in the program. And they said the program should include all three. So there was introduced a bill proposing to include the Extension Service, the research people, and the marketing division in the various departments of agriculture, and in doing that why they wind up by certain provisions being put in H.R. 1690, asking for their funds separately, and they got it after killing ours, when we asked it, using the Farm Bureau to help see that it should be included. . . ."³⁴

Seven directors of state experiment stations testified. They maintained that funds for research in the states should be available only to the experiment stations; the state departments of agriculture should be confined to marketing services. This division of labor preserved the traditional pattern, as did the provision of the bill centering Federal research in the field of utilization.

³² This association has been described by its executive vice-president, C. W. Kitchen, as "a national organization whose members reside in every state and in several provinces of Canada. This include shippers—many of whom are both producers and distributors—cooperative marketing associations, brokers, jobbers, wholesalers, and representatives of allied industries. . . ." (*Long-Range Agricultural Policy*, Hearings of the House Committee of Agriculture, 80th Cong 1st Sess. Part 3, p. 239.

³³ *Long Range Agricultural Policy*, op. cit. Part 2, pp. 175-176. At its annual meeting in 1946 the association commended W. Kerr Scott for his "persistent and untiring efforts" to obtain the legislation.

³⁴ *Agricultural Research*, op. cit., p. 169.

With this backing, and without a word of criticism having been directed against it (the members of the Committee on Agriculture, all from farm districts, were among the most vigorous proponents of the legislation), H.R. 6932 was passed without a dissenting vote.

Background Forces

Farmers turned to science only when they reached the end or the frontier of free land; since that time, however, the dominant interests in agriculture have shaped agricultural research policy. When Connecticut farmers found it necessary to use fertilizer, the first experiment station was established (in 1875) to make tests of the unreliable product then on the market. In 1887 (three years before the Census declared the frontier closed) the Hatch Act established experiment stations as divisions of the Land Grant colleges and gave them Federal support. At this time the agricultural research of the Federal government was devoted chiefly to soils and fertilizers, the composition of plants, food and drug adulteration, and the manufacture of sugar.³⁵

After 1890 the impact of the city, the machine, the laboratory, and the market-place was profound. Farmers in the better land areas were soon keeping books and calling themselves businessmen; indeed the Adams Act of 1906 authorized further research on the "agricultural industry" of the United States. Liberty Hyde Bailey believed a new and distinctive rural culture would flower from agricultural science. "The leadership in rural affairs," he wrote in 1908, "is rapidly passing to the interests that associate themselves with the agricultural colleges and experiment stations. In twenty-five years there will be a new political philosophy of the open country born out of these institutions."³⁶

The new political philosophy appeared somewhat ahead of schedule but it turned out to be of a kind that rejected the "uplift" in Bailey's country life movement. The "farm businessman" was not in the least bit sentimental about agriculture as a way of life. He wanted to make money. Agricultural science was put to his

³⁵ Cf. Paul H. Johnstone, "Old Ideals Versus New Ideas in Farm Life," *Farmers in a Changing World*, pp. 111-167, and A. C. True and V. A. Clark, *The Agricultural Experiment Stations in the United States*, Bulletin No. 80, Office of Experiment Stations, 1900.

³⁶ *The State and the Farmer*, New York: 1908, pp. 15 and 168.

purpose; "making two blades of grass grow where one grew before" was its slogan.

After the World War (in 1920) there was a sharp break in farm prices. Now the farmer needed a science that would tell him not merely how to produce but how to make money as well. W. J. Spillman became a leading figure in the Department; in 1922 the Bureau of Agricultural Economics was organized, and in 1925 the Purnell Act was passed. At the same time, the farm organizations were growing in strength, acquiring professional, urbanized leadership, and establishing offices in Washington. By 1930 the states had received about \$9,600,000 under the Purnell Act and nearly one-half of this had been used for investigations in economics, rural sociology, and home economics.³⁷

From 1925 to 1930 the experiment stations made 463 studies in economics. Of these 162 had to do with marketing. The spread between what the consumer paid and what the farmer received had long been a grievance to both farmers and consumers³⁸ and in the late '20's the idea grew that this price spread was the source of most of the farmer's ills. The act establishing the Farm Board in 1929 declared it "the policy of Congress to promote the effective merchandising of agricultural commodities in interstate and foreign commerce, so that the industry of agriculture will be placed on a basis of economic equality with other industries."

While surpluses mounted in the early '30's, farmers put marketing at the top and production at the bottom of their list of needs.³⁹ Experiment station directors talked of their achievements in reducing production,⁴⁰ but at the same time they jealously guarded the vested interest they had established in production research. "The state experiment station has gained the moral and political support of the state by its service to local interests," an official

³⁷ Walter H. Evans, "The First Five Years of the Purnell Act," *Proc. of the 44th Ann. Conv. of the Assoc. of Land-Grant Coll. and Univ.* 1930 (published 1931) pp. 224-231.

³⁸ J. D. Black and M. E. Kiefer, *Future Food and Agriculture Policy*, 1948, p. 156.

³⁹ H. C. Ramsower, "What Changes in Extension Programs Are Demanded by the Present Agricultural Depression?", *Proc. of the 45th Ann. Conv. of the Assoc. of Land-Grant Coll. and Univ.* 1931, (published 1932) p. 304.

⁴⁰ In 1932 Director F. B. Mumford of Missouri cited the experiment station's advice to farmers to dispose of about one-third of all cows being milked. "Clearly, this would greatly decrease the production of milk," he said, "would relieve the farmer from losses which he now experiences, and increase not only the profit per cow of the animals remaining but his total profit. . . ." *Proc. of the 46th Ann. Conv. of the Assoc. of Land-Grant Coll. and Univ.* 1932 (published 1933), p. 259.

committee reported in 1931. "... if local control of its functions were to be divided by any competitive influence the experiment station would rapidly lose its leadership and the confidence of the people. A disastrous reduction of financial aid from the state would follow."⁴¹ The Farm Board and the AAA strengthened the farm organizations and the processors and distributors. Commodity organizations (the American Farm Bureau and many of its state affiliates set up commodity departments during the '30's) came to represent "producers" or "growers" of this or that commodity; if there were any "farmers" left, they were virtually unrepresented. During the war, distributors (including Mr. Meyer, the Administrator of the Act) assumed important places in the Department. There were charges that the Department, in which the producers were supposed to have a proprietary interest, had been turned over to the distributors, but the fact was that producer and distributor interests had become almost indistinguishable. It was not surprising that the word "farmer" did not appear anywhere in the Research and Marketing Act.

Chemurgy

According to Wheeler McMillen,⁴² president of the National Farm Chemurgic Council, Inc, and editor of the mass-circulation *Farm Journal* and *Pathfinder*, farm chemurgy (industrial utilization of farm-grown materials) came into existence one night in 1924 when he heard the president of the United States Chamber of Commerce tell a meeting of the American Farm Bureau Federation: "Unfortunately the human stomach is not elastic." Three years earlier McMillen, then an Ohio hog-farmer, had been caught in the price break. Now, as a farm editor, he found no one could discuss the condition of farm business without talking about surpluses. The Chamber of Commerce president's remark suggested an idea which soon became a crusade.⁴³

⁴¹ "Report of the Committee on Federal-State Relations in Research," *Proc. of 45th Ann. Conv. of Assoc. of Land-Grant Coll. and Univ.* 1931, (published 1932), p. 521.

⁴² The account of the Chemurgy movement given here is based, except as otherwise noted, on Wheeler McMillen, *New Riches from the Soil*. (D. Van Nostrand Company, New York: 1946). The book is a remarkable exposition of the mentality and technique of a gifted mass-manipulator.

⁴³ McMillen says that chemurgy is not a "major panacea" but "if sedulously applied, (it) will effect more complete cures for economic and social ailments than the remedies applied so far by the statesmen" (*op. cit.*, p. 8). His associate, Dr. William

McMillen spent most of 1926 talking to scientists and others about his idea for the industrial utilization of farm products. He found the Department of Agriculture scientists not at all enthusiastic.⁴⁴ Secretary of Agriculture Jardine referred him to Secretary of Commerce Hoover. Hoover thought the idea was sound and the next Congress (perhaps by coincidence, McMillen says) got a request from Hoover for \$50,000 to be used by the Bureau of Standards in testing industrial uses of farm products. Secretary Jardine may have been moved to action too (although McMillen says nothing of this) for in 1927 he assigned a scientist to survey the possibilities of increasing the industrial use of farm products.⁴⁵ In 1930 the Forest Products Laboratory was taken as a precedent for the establishment of an Agricultural By-products Laboratory at Ames, Iowa, which was to study the possible uses of cornstalks, bagasse, cotton stalks, cotton seed, cotton hulls, cotton lint and linters, and rice.⁴⁶

Meanwhile McMillen and a fellow-editor, Clifford V. Gregory, were publicizing the industrial-use idea in their magazines and McMillen wrote resolutions on the subject which were adopted by both the Grange and the Farm Bureau. Dr. William J. Hale, a consultant for the Dow Chemical Company and a writer for Henry Ford's *Dearborn Independent*, joined McMillen in the crusade. Working together, the journalist and the scientist (Hale was chairman of the organic chemistry committee of the National Research Council) found they could get articles published in *Colliers* and elsewhere. In 1929 McMillen published a book, *Too Many Farmers*, and in 1934 Hale published *The Farm Chemurgic*, which was widely distributed by the Chemical Foundation, an organization established by the government to receive the income (\$18,000,000) from German chemical patents confiscated during the war. Francis

J. Hale (in *The Farm Chemurgic*. The Stratford Company. Boston 1934) has made chemistry the central principle of existence: "There is naught else but a chemical world and we are adrift on a chemical sea. . . ." (*op. cit.*, p. 126).

⁴⁴ One of the USDA scientists virtually recommended that he spend his time on something more fruitful, McMillen writes, (*op. cit.*, p. 23) but "It is only fair to add that a dozen years later, after some millions of dollars had been appropriated for chemurgic research, this gentleman became one of the ablest and most enthusiastic of advocates."

⁴⁵ This study appeared as a book. George M. Rommel, *Farm Products in Industry*. New York. 1928

⁴⁶ See "Establishment of a Laboratory for Utilization of Waste Agricultural Products," Serial G, *Hearings*, House Committee on Agriculture, 71st Congress, 2nd Session, 1930.

Patrick Garvan, the president of the Foundation, not only subsidized the distribution of Hale's book but also financed the Farm Chemurgic Council into its third year (1937) at a cost of about \$125,000 a year. The Council was organized at Dearborn at a conference of agriculture, industry and science which was sponsored by Ford,⁴⁷ the national farm organizations, and a committee headed by the editor and publicist, Gregory.

"For two days speakers described present and possible developments in chemurgic types of research and industry," McMullen has written.⁴⁸ "Network and local radio broadcasts and excellent news coverage carried the story over the country and aroused interest far beyond the attendance. Col. Frank Knox, Irénée DuPont, Dr. Karl T. Compton were among the more eminent speakers. Mr. Ford signed the check for a luncheon to the entire group and put a fleet of automobiles at the disposal of those of us who were directing the affair. . . .

"Garvan announced that the Chemical Foundation would pay the expenses of the organization for one year. Fritzsche immediately opened an office at the Dearborn Inn, a good place from which to capitalize on the success of the conference. The Sears-Roebuck Company paid for printing several thousand copies of the conference proceedings, which, when distributed, attracted the interest of many new people, especially among farmers. Every Grange in the country received one.

"Dr. H. E. Barnard, a chemist and a good speaker, joined the staff as a science advisor. Hugh C. White took charge of publicity, and other help was employed.

"A demand soon arose for local and regional conferences. Meetings were held at Pensacola; Beaumont, Texas; Jackson, Miss; Macon, Ga; Alexandria, La; Fresno; Omaha; and elsewhere. Usually these were two-day sessions with plenty of time for agricultural scientific, and business people to discuss fully the chemurgic possibilities of their areas. More than one permanent convert was won by putting him on a program where he talked himself into an enthusiastic conviction."

So great was the interest aroused by this promotional campaign

⁴⁷ "Ford's name on the invitations had made them important," McMullen explains, p. 33.

⁴⁸ McMullen, *op. cit.*, pp. 33 and 35-36.

that the second and third annual chemurgic conferences had to be moved from the Dearborn Inn to a downtown Detroit hotel.

According to McMillen.

"The national and regional conferences all received generous treatment from the press and radio. The news purveyors recognized an interesting new idea. They saw that important national and local names were conspicuous in the meetings. They sensed the presence of controversy. Whoever read the papers closely began to be conscious of chemurgy. Proceedings and papers were distributed extensively to prominent people. Where a seed might fall and sprout was unpredictable."⁴⁹

One of the seeds sprouted (McMillen goes on to explain) in the mind of Senator Theodore Bilbo in whose state of Mississippi one of the conferences had been held.⁵⁰ Bilbo drafted a bill to provide a Federal utilization laboratory for Mississippi, later he redrafted the bill to provide a total of \$4,000,000 for four laboratories, one for each major region of the country.⁵¹ Bilbo's proposal reached a conference committee as an amendment to the AAA act of 1938. An administration leader, possibly Secretary Wallace, suggested to the committee that the amendment be redrafted to provide \$100,000 for a survey of the need for such laboratories. By a clerical error, both the \$4,000,000 for the laboratories and the \$100,000 for the survey were included in the Act.⁵²

The AAA Act directed the Secretary to establish the four laboratories. Accordingly he appointed a special staff of scientists to decide upon the locations of the laboratories and to plan the research to be carried on in them. The staff visited every state and interviewed representatives of about 1300 research laboratories, educational institutions, and agricultural organizations. At the same time it reviewed more than 10,000 research projects which had already been undertaken in the general field of utilization. In

⁴⁹ *Ibid.*, p. 299

⁵⁰ The National Cotton Council may possibly have received some of its inspiration from this conference. The Council was organized by Oscar Johnson of Mississippi in the same year, 1938. At any rate, the two councils, Cotton and Chemurgic, are now close together, as evidenced by the fact that Wheeler McMillen was a speaker at the Cotton Council's 10th Annual Meeting in Atlanta, Jan. 21-23, 1948. The Cotton Council passed a resolution commending McMillen for his "unparalleled" contribution to agriculture through the chemurgic movement.

⁵¹ Bilbo's proposal would also have provided \$1,000,000 for marketing and merchandising activities. *House Hearings on Agriculture Department Appropriation Bill, 1940*, p. 444.

⁵² McMillen, *op cit.*, p. 301. See also T. Swann Harding, *Two Blades of Grass* (University of Oklahoma Press: 1947) p. 53

1939 Secretary Wallace transmitted a book-length report of this study to Congress.⁵³ The report revealed no enthusiasm for the new laboratories. It pointed out that "in our young and dynamic nation research patterns which fit today's needs are unlikely to satisfy the needs of the future." "One certain and permanent value of the laboratories," it concluded, "will rest on the fact of their physical existence."⁵⁴ Dedicating one of the laboratories, Mr. Wallace said, "If we expect the fantastic dreams of the chemurgic leaders to be realized in the near future, then we are bound to be disappointed. But if we are patient and look farther ahead we can expect helpful results from the work of the laboratories."⁵⁵

The passage of the legislation creating the regional laboratories took the state experiment stations by surprise. Meeting late in November 1938, the station directors considered the new situation.⁵⁶ R. E. Buchanan of Iowa, speaking on the subject, "In What Ways Can the State Agricultural Experiment Stations Advantageously Undertake Research in the Industrial Utilization of Agricultural Products?", concluded, "The public has demanded and Congress together with both parties, farm organizations, Farm Chemurgic, and many individuals have approved investigations in this field. Although public clamor for a particular course of action scarcely proves its desirability in anything other than a political sense, there does seem to have been enough careful study by competent scientists to warrant the conclusion that research is needed on the industrial utilization of agricultural products." Another speaker reported that \$16,000,000 would be needed for industrial utilization research. If only \$4,000,000 of this went to the regional laboratories, might not the experiment stations advantageously use the remainder?

Far from being satisfied with the four Federal laboratories, the Chemurgic movement went on to greater things. In 1939 Dr. Hale published another book in which chemurgy was mixed with adulation for Adolph Hitler and contempt for decadent, unscientific democracy.⁵⁷ The National Farm Chemurgic Council opened

⁵³ *Regional Research Laboratories*, Senate Document 65, 76th Congress, 1st Session, 1939.

⁵⁴ *Ibid.*, pp. 9 and 403.

⁵⁵ Quoted by McMillen, *op. cit.*, p. 302. "No one could entirely deny Mr. Wallace's jibe," McMillen says of this guarded statement.

⁵⁶ *Proc. of the 52nd Ann. Conv. of the Assoc. of Land-Grant Coll. and Univ.*, 1938, (published 1939), pp. 181 and 186.

⁵⁷ William J. Hale, *Forward March*. Coward-McCann Inc., New York. 1939, p. 202ff.

offices in Columbus, Ohio and in the Empire State Building. These offices are managed by the Council's full time secretary and treasurer, each of whom has a staff of assistants. The Council publishes *Chemurgic Digest* semi-monthly and maintains an Information File Service which mails six to eight thousand reports monthly. There are branches of the movement in most states and in several foreign countries; associate members pay \$10 a year, while contributing members, mostly corporations, pay dues "in three figures." A Board of 31 Governors directs the policy of the Council.⁵⁸

III

The research and marketing program may be regarded as the product of an ideology, a mode of thought directed toward the maintenance of the existing order.⁵⁹ To solve the surplus problem in a certain manner (e.g., by maintaining high mass purchasing power while effecting production adjustments such as BAE proposed for cotton) would entail consequences offensive to the dominant interests in agriculture and other segments of the economy. From a field of vision structured by the wish to maintain the status quo, the research and marketing program appears as a happy solution to a painful problem—a solution which partakes of some of the most popular symbolism (since it goes under the name of science and efficiency), violates no prejudices, and poses no con-

⁵⁸ See McMillen, chapters XX "Chemurgy Reaches the Grassroots" and XXI "How the Chemurgic Council Works." The membership of the Board of Governors is listed pp. 349-352. The representatives of agriculture are of course all businessmen; they include, for example, Cornelius J. Claassen, whose company operates 1300 farms for other owners and D. Howard Doane of *Doane Agricultural Service*. Among the representatives of science are some distinguished names, including Karl T. Compton and Robert A. Millikan.

⁵⁹ The study of bias becomes the Sociology of Knowledge only when the situationally-bound nature of the observer's perspective, as well as that of the observed, is set forth. Accordingly it is incumbent on the writer to make his own bias explicit as well as he can.

The underlying reality here is the surplus problem. Unlike Wheeler McMillen (who knew that "millions of human stomachs around the world were insufficiently filled" but saw in this "conditions . . . not markets" *op. cit.* p. 20.), the writer sees in it an opportunity, not a threat—he sees an opportunity for widespread consumption programs (insufficiently filled stomachs make a powerful emotional appeal on him), for taking measures to expand the industrial economy to the point where it will absorb underemployed farm people and, (and here the emotion is very strong) for a reorganization of the Southern economy which will improve the position of the Negro. Thus the writer's point of view is what Mannheim called Utopian, i.e. incongruent with reality because oriented toward changing it.

Although he has the very important advantage of being aware of his bias, the writer's criticism of opposing ideologies is probably closer to the objective reality than would be any proposals that might arise from his own view.

ceivable threat to the existing economic, social and political order

That it arises from this interest-bound source by no means invalidates the idea of the program, on the contrary, it may derive a unique value from this origin. The question can only be decided by an examination of what it leads to in action. Can laboratory research make an important contribution to the solution of the surplus problem? Can marketing research and services significantly expand the market? In short, is the program congruent with the nature of science and the underlying realities of the situation toward which it is directed?

Program and Reality

There is serious reason to doubt that the surplus problem will be solved in the laboratory.

Only a few industries (fuel, paper, and building) could absorb any appreciable portion of the basic crops.⁶⁰ Yet to achieve a significant result, uses must be found for enormous volumes; hundreds of successful projects (like that which produced the drug rutin from buckwheat) would have virtually no effect on the surplus problem. Moreover, to displace a raw material now in use a farm product must offer an economy. It is possible to produce alcohol from grain, but it is cheaper to produce it from petroleum or wood. To suppose that chemistry can drastically alter the ratio of costs is unwarranted. Because the tendency is for less costly to replace more costly materials, agricultural products will doubtless continue to lose ground rather than to gain it.⁶¹ Indeed, if chemurgy were to succeed (if

⁶⁰ W. H. Cook, "Industrial Uses of Agricultural Products," *Agricultural Institute Review*, (Ottawa) 1.5 (May 1946) pp. 363-368. In the only critical discussion of this question by a natural scientist that the author has been able to find, Dr. Cook, the director of applied biology at the National Research Laboratory at Ottawa, says that the best prospects lie in finding new crops which are adapted to industrial uses and in finding new uses for wastes. He takes a dim view of the notion that existing surpluses can be used industrially at a profit to the farmer.

The only critical discussion by a social scientist, so far as the writer can discover, is that by T. W. Schultz in this JOURNAL: "Economic Aspects of New Industrial Uses for Agricultural Products," 20.1 (Feb. 1938), pp. 134-139.

In answer to an inquiry from the writer, E. G. Moore, Coordinator of Research Publication for the Agricultural Research Administration, wrote on May 28, 1948: "So far as I know, no one has questioned the desirability of research on utilization and marketing. I presume, however, that someone, somewhere, would question anything attempted by the Federal government."

⁶¹ For evidence that they are losing ground see F. L. Thomsen, *Marketing and Transportation Situation*, BAE, Nov. 1945, p. 8. Also "Industrial Utilization of Farm Products," *Technological Trends and National Policy*, National Resources Committee (June 1937) pp. 130-151.

potatoes were to replace wood as a source of alcohol, for example) it could only be because agriculture had become so "efficient" that the farm population could be almost altogether dispensed with.

Whatever successes are achieved in utilization research are likely to add to the surplus of one crop while subtracting from that of another.⁶²

That the Department is sceptical of what may be accomplished along these lines in the laboratory may be seen from the fact that it now recommends subsidies to make industrial diversions feasible. "Some of those industrial uses would be valuable primarily as a matter of national defense," a Department spokesman testified not long ago.⁶³ "Others of these uses, however, could with a bit of aid in the early stages, stand on their own feet under normal conditions. The encouragement of this latter group should be undertaken as an aid to agriculture, particularly as a market for large surpluses."

One may doubt that the surplus problem will be solved in the laboratory. In any case, it would seem that research of this kind is essentially no more appropriate a solution to the surplus problem than would be research directed toward finding new uses for, say, shoes, if shoes happened to be produced too abundantly in our

⁶² For example while the USDA makes an elaborate effort to find new uses for cotton, it also conducts research 1. on zein (the alcohol-soluble portion of corn-gluten) for the production of a zein fibre, 2. on residues such as straw for (among other things) a sugar, xylose, which can be converted into furfural which may serve as a raw material in the manufacture of nylon, 3. on feathers, which can be mixed with wool, nylon, or rayon (but apparently not cotton) or converted by chemical treatment into a synthetic protein fibre, 4. on oilseed byproducts, from the proteins of which fibres may be made, 5. on milk, for casein fibres to be used in textiles; 6. on wood and wood wastes, for paperbags which will compete with cotton.

The complexity and importance of the interrelations within the agricultural segment of the economy may be seen from the following "Farmers of the Corn Belt had traditionally followed a corn-oats or corn-oats-clover cycle. The rapid disappearance of the horse from the American scene seriously restricted the market for oats. The possibilities of soybeans as a replacement crop were known to some feed manufacturers and to the Department of Agriculture and the midwestern experiment stations. A vigorous extension campaign and careful selection of suitable varieties resulted in an increase in production from 8 million bushels in 1928 to about 80 million bushels in 1939. The market absorbed this new crop readily, but its products go mainly into the food and feed markets, where they compete directly with cottonseed products. The only discernable remedy for this situation is to discover, through research, other destinations for the soybean crop than the nonexpandable human or animal stomach, and on this the Urbana laboratory is working." Van Arsdell, W. B. "The Industrial Market for Farm Products," *Farmers in a Changing World, the Yearbook of Agriculture*, 1940, p. 609.

⁶³ *Long-Range Policy*, *op. cit.*, p. 154.

economy. That subsidies should be recommended for this purpose is of course ominous.

The case is even plainer with the marketing program. It will not increase the amount that consumers have to spend. At best, then, it can only persuade them to spend more for food and less for other things, or more for some foods and less for others, a process which cannot possibly solve the surplus problem. Indeed merchandising tricks like advertising and fancy packaging will actually reduce the volume of food sold by adding to its cost. As to economies that may result from "efficiency" brought about by the program,—“I do not want to over-emphasize those possibilities,” C. W. Kitchen, one of the marketing program's most ardent advocates, has said.⁶⁴

One might think that the traditional, “two blades of grass where one grew before” type of research would not suffer from this ideological bent. But recently the National Advisory Council recommended: “that production research place emphasis upon the maintenance of desirable balances between plant and animal products and between individual commodities consistent with the demand for such commodities and the conservation of natural resources.”⁶⁵ Whether this is indeed a feasible basis upon which to plan a program of production research may also be doubted.

The Role of the Scientists

Within its inherent limitations, the program will be more or less fruitful depending, among other things, upon the effectiveness with which it uses scientists, and, through them, science itself. The ideology underlying the program must therefore be examined in this new relation.

Here the testimony of scientists themselves should be of value. It should be noted, however, that this value is very significantly qualified by the fact that the scientists who participate in policy formation are administrators as well as scientists. An agricultural scientist, said Harvey W. Wiley, one of the earliest and best of them, is one who knows how to make two dollars grow on an ap-

⁶⁴ *Long-Range Agricultural Policy, op. cit.*, pp. 293-294. It is interesting to note that the BAE, in its *Study of Selected Trends and Factors Relating to the Long-Range Prospect for American Agriculture*, expects the reduction of marketing charges will be a “difficult task” despite the marketing program (*ibid.* p. 56). Cf. also the opinions of O. H. Brownlee in this JOURNAL (Feb. 1948, p. 68) and of William H. Nicholls in the same issue.

⁶⁵ USDA Press Release 834-48 (April 22, 1948).

propriations bill where only one grew before.⁶⁶ Moreover, apart from this, most agricultural scientists—both natural and social scientists—are employed by public agencies,⁶⁷ state or Federal, and therefore are not at liberty to speak their minds in full. The example of BAE is before them.

In their testimony before Congressional committees the natural scientists generally find it safer to use words without meaning or to exploit the prejudices and preconceptions of their listeners. Thus Dr. Lambert, head of the Agricultural Research Administration, advises the appropriations subcommittee: "The best world, I believe, will be one in which farmers and scientists are tooled up to meet emergencies as they may arise. Now, I think that in addition to possible emergencies it is just good business to keep our plant tooled up so that we are getting facts that will help the farmer as much as possible at all times."⁶⁸

When the natural scientist in the Department does speak seriously, and as a scientist rather than a publicist, he never fails to point out the importance of fundamental as opposed to applied research. "In our desire to find quick answers to puzzling problems," Dr. Lambert testified recently, "we must bear in mind that the progress of applied research is determined by the support given fundamental research. We must not expect science to serve as an instrument of policy, rather we should look to science to increase our knowledge and look to policy as an expression of how

⁶⁶ Harvey W. Wiley, *An Autobiography* Indianapolis. 1930, p 193 Thus Dr R. W. Trullinger, the chief of the Office of Experiment Stations, reports to the appropriations subcommittee that the stations have used 40% of the 1948 Research and Marketing Act allotment (twice the proportion required) for marketing research, a use necessitated by impending surpluses, and at the same time urges an increase in funds for 1949 on the ominous grounds that "farmers are faced with the necessity of continuing production at unprecedented high levels in order to meet world needs for food and fibre. This means continuation and intensification of high-pressure production practices by all means available including especially the adoption of all known measures for increasing efficiency in the production and utilization of food, feed and fibre." *Approp. Hearings*, p 598.

⁶⁷ In a paper given before the Farm Economics Association in 1939 (*THIS JOURNAL* 21:1, p. 8), H. R. Tolley observed that over 100 of the 116 agricultural economists attending the association's meeting were on the public payroll. Charles E. Kellogg has called attention to the fact that most natural scientists in agriculture are employed by public institutions ("What is Farm Research?", *Science in Farming, the Yearbook of Agriculture* 1943-1947, p 22.)

For an illuminating discussion of some problems in the formulation of social science research in agriculture see Charles M. Hardin, "Programmatic Research and Agricultural Policy," *THIS JOURNAL* 29:2 (May 1947), pp 371-374.

⁶⁸ *Approp. Hearings*, p. 566.

we want to use our knowledge. Even in applied research we cannot buy results like beans in the corner store. . . . Some dollars and some projects may never produce the answers we are looking for. . . ."⁶⁹

While the scientist-administrators of the Department unfailingly point out the need for fundamental research, they are also quick to rationalize, in the name of democracy, their subservience to the demands of pressure groups for applied research. "Sometimes," writes Charles E. Kellogg of the Bureau of Plant Industry, Soil, and Agricultural Engineering,⁷⁰ "items of popular interest receive undue emphasis at the expense of more important fundamental research. . . ." (Dr. Kellogg's own bureau spent \$63,900 on fundamental and \$7,142,400 on applied research in 1947) " . . . but," Dr. Kellogg continues, "on the whole the agricultural research program has benefitted from this procedure; *it has been forced to keep close to the real problems of the people.*" (Italics added.) Having supplied this justification, Dr. Kellogg goes on to speak of what concerns him as a scientist: "Thought must be given to ways for broadening the scope of individual appropriation items to allow greater discretion to the scientists themselves; holding scientists accountable for their use of public funds; and avoiding unreasonable dictation as to what the scientists shall investigate."

To a Congressman or a pressure group representative, a scientist is no different from other not-very-well-paid employees—he ought to expect to take orders from the person who pays him and to be fired if he doesn't produce results. Congressman Clarence Cannon, as chairman of the House Appropriations Committee, pointed out with amazement that the Department actually retained on the

⁶⁹ *Long Range Agricultural Policy, op cit* p 57 According to William H Nicholls (this JOURNAL, *op cit*) it will be "inexcusable" if fundamental research in marketing is not done under the Act

To the writer it seems that science must serve as the instrument of policy, for the notion of "science for sciences' sake" is absurd The real question is what policy (i e., directed by whom and toward what objectives) will result in the greatest short and long-run returns. While the scientists' unanimity on the importance of fundamental research is impressive, it ought not to be accepted uncritically. The subject is one that will bear a great deal of investigation.

⁷⁰ "What is Farm Research?" *Science in Farming, op. cit.*, p 24 For another instance of this kind of rationalization, see the Department's statement in The President's Scientific Research Board, *Science and Public Policy*, Vol. II "The Federal Research Program," p. 111 In this report (p. 114) the Department's expenditures for fiscal 1947 are broken down by Bureau and by type of research The totals are as follows (in thousands): "fundamental" \$2,471 1, "background" \$10,728 2; "applied" \$13,711; and "development" \$4,417 4

payroll scientists who did not produce the desired results in what the Congressman considered to be a reasonable length of time.⁷¹ Recently a member of the National Advisory Committee—Robert R. Coker, vice-president of Coker's Pedigreed Seed Company and a director of the National Cotton Council—told Mr. Cannon that the Advisory Committee had arranged to get from Mr. Meyer a list of the research projects by geographic area so that the committeemen can "look in on the man doing the work and try to form our own opinions as to its value." This sounded like a good idea to Mr. Cannon. "By all means," he said, "It is difficult to see how you could effectively judge what is being done unless you did look into it personally."⁷²

Conclusion

What conclusions may be drawn from the Sociology of Knowledge for use in planning agricultural research? The first is that bias ought to be made explicit. Every perspective has its societal setting and therefore complete objectivity is quite impossible of attainment. The closest we can come to objectivity is to understand our biases and to compensate for them deliberately. Bias may be fruitful, while objectivity, if it could be attained, would be sterile for many purposes. There is no absolute truth, there are only "relational truths;" these consist of relations among the situationally-congruent elements of various perspectives. Thus it is by self-conscious examination of widely different biases that we are most likely to arrive at truths having predictive value.

This means that Congressional committees ought to include some members who do not depend on farm support⁷³ and that (like the courts with their public prosecutors and the Church with its Devil's Advocate) they should take pains to hear witnesses who

⁷¹ *Approp Hearings*, p. 576. See the same point of view expressed by Representative Whitten, *ibid.*, p. 805, and Representative Andersen, *ibid.*, p. 808. In the House Hearings for fiscal 1940 (p. 168), see Representative Lamberton's proposal that the USDA research facilities be abolished and prize-essay contests substituted.

⁷² *Ibid.*, pp. 527-528.

⁷³ "I do not know that there has ever been an instance since I have been around Washington when anyone not from an agricultural district or agricultural State has been given an assignment upon the Agriculture Committee in the House or Senate," Senator White of Maine remarked not long ago. "I am just wondering," he went on, "whether, as a matter of principle we ought to have a representative of the consumers upon the Agriculture Committee." *Organization of Congress, Hearings of Joint Committee on Organization of Congress, 79th Cong 1st Sess., 1945*, p. 882.

will present the case *against* as well as for. Scientists who have no connection with agriculture or with institutions dependent upon appropriations ought to participate as consultants in the planning of agricultural research. There should be an end to administration by pressure groups.⁷⁴ The planning process ought to be administered by persons trained in the traditions of the scientist and the public servant and trained, too, to recognize biases (their own as well as others') and to sort values from facts, insofar as that is possible.

It may be objected that it is naive to suggest a rational procedure for planning under the Research and Marketing Act because of the unplanned and irrational character of the Act itself and of the forces behind it. If planning is to make sense, it may be argued, it must be powerful enough to deal with the central issues (the surplus problem), not merely those at the periphery of interest. If the Act is no more than an incident, a by-product of politics, if it is merely an obstruction thrown in the way of the power-seekers by the power-holders (who know that they can neither front the surplus issue nor leave it alone), then surely the directive power must concern itself with the central political issue, the surplus problem.

But the "scientific" method may not be an appropriate or desirable approach to a political problem, it may be further objected.⁷⁵ The issue is a struggle over power. The reasonable way may therefore be quite inappropriate. Indeed it may succeed only in preventing a resolution of the power struggle and the attainment of an equilibrium of power in which rational activity could proceed in a routinized way.

Without attempting again the task of taking the politics out of politics, it may be pointed out that planning may serve a useful purpose by changing the terms of the power struggle. A development plan (in city planning the term is "master" plan), for example, may project a desirable pattern of growth far into the future. It is against this pattern, which has been approved by the public

⁷⁴ Paul H. Appleby, a former Under-Secretary of Agriculture writes, "Government must be big enough and powerful enough to be definitely superior to any and all special-interest groups. By the same token, governmental power should be exercised only by government-minded persons, by persons sensitive to the public interest and to public opinion and publicly responsible for their official acts." Readers of this article may not agree with Mr. Appleby's next sentence "It is so exercised in the United States government today." *Big Democracy*, New York 1945, p. 88.

⁷⁵ See H. J. Morgenthau, *Scientific Man and Power Politics*, University of Chicago Press, 1946.

and cannot be capriciously changed, that important proposals must be judged. The development plan, then, casts a beam of light far into the future where it illuminates the alternatives, the real ones and the spurious ones. The surplus problem can then be seen in its real nature in relation to the measures that will be taken for its solution, measures which may be *a*, *b*, or *c* (all of which are congruent with reality) as the play of power politics may determine. But, if, as an incident in the power struggle measures *d* and *e* are proposed, it will be seen in the light of the development plan that these are not congruent with the reality, that they are indeed obstructions. Thus politics will have become a somewhat more elaborate and difficult game, since it will have to take reason into account as never before, "How is it possible," Mannheim asked, "for man to continue to think and live in a time when the problems of ideology and utopia are being radically raised and thought through in all their implications?"⁷⁶ Alongside of this a parallel question may be phrased. in a time when a development plan exists, how will it be possible to live as if no plan existed?

⁷⁶ *Op. cit.* p 38 and especially 169.

ADAPTATION OF THE FARM CAPITAL STRUCTURE TO UNCERTAINTY*

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Bureau of Agricultural Economics

THE major area of interest in economic uncertainty is its conditioning influence on the structure and operations of the firm. Both general observation and an extensive literature on the theory of uncertainty suggest the operation of a number of such conditioning influences. But empirical verification so far has made little progress. This paper is concerned with the rather limited objective of presenting a few data bearing on apparent adaptations of the capital structure of agriculture to two different kinds of uncertainty situations.

As terminology in this field is far from standardized, the meaning attached to certain terms used here needs to be clarified at the outset.¹ The term "capital structure" is used in a broad sense to include the entire group of financial arrangements through which the firm achieves and retains control over resources used in its operations. Capital-structure adaptations thus include those relating to leasing arrangements as well as to the usual types of equity and credit financing. In this connection, the "farm firm" is treated as an impersonal entity conceptually separate from those persons who may participate in its operation and financing—operators, landlords, and creditors. This is much the same concept as that often used in accounting theory to define "the business." Such a concept is necessary if the capital structures of farms with different tenure and other financial characteristics are to be placed on a comparable basis for further analysis.

As capital structure adaptation is only one of several possible kinds of adaptations to uncertainty, it would not be surprising to find agricultural situations in which the degree of uncertainty confronting the firm differs greatly but in which capital structures show little difference. Adaptation might take other forms, such as

* This represents a revision of a paper prepared for informal discussion at a research conference on problems in economic uncertainty at the University of Chicago in June 1948.

¹ No claim is made for the superiority of these concepts and definitions for all analytical purposes. They are used in this paper in part because of the nature of the data available for study.

adjustment in the size of farm business or greater diversification of farm enterprises. But the adaptations of capital structure that do take place would be expected to be consistent in general with the *economics of the firm*. In general, capital-structure patterns would be expected to reflect a tendency for the cost of uncertainty bearing to the firm to be reduced to a minimum in view of the requirements of continued efficient operation of the firm as a whole. Put in another way, the capital structure would be expected to adjust to uncertainty in such a way that arrangements for uncertainty bearing in the capital structure would tend to become adapted both to the circumstances causing the uncertainty and to the relative efficiencies of different types of capital suppliers in performing the uncertainty-bearing function.

Data are not available to test for all, or even for a large number, of the possible causal relationships of uncertainty to farm-capital structure. Only two kinds of situations are considered in this paper: (1) Wide differences in uncertainty for the firm that stem from variability of crop yields caused mainly by natural hazards; and (2) wide differences in uncertainty for the firm that stem mainly from variations in the importance of day-to-day management in its financial success. High uncertainty of the first type is analogous, in the nonfarm field, to that found in speculative mining and oil-drilling ventures. High uncertainty of the second type is likely to be found among such nonfarm enterprises as specialized retailing in which careful attention to day-to-day details makes the difference between success and failure.

Development of data relating to these two types of uncertainty situations permits additional analysis that cannot be made on the basis of data relating only to uncertainty of one particular type. As already mentioned, one would expect in general that capital structure adaptations to high uncertainty would distribute the uncertainty bearing function in such a way as to minimize the cost of performing this function. But the particular form that the adaptation takes would be expected to vary with the relative efficiency of different groups in performing this function. This in turn may reflect the varying circumstances which give rise to the uncertainty. Cross comparisons of the patterns of adaptation found in the case of the two types of uncertainty situations can be made on the basis of specific items relating to the capital structure patterns of farms.

For purposes of this study, variations in the first type of uncer-

tainty are illustrated with data for 24 Great Plains wheat counties which have widely different records of wheat acreage abandonment. Variations in the second type of uncertainty are illustrated with data for 27 counties in the North Central States in which the proportion of total production represented by dairy products varies widely. In this 27-county sample, it is assumed that the importance of day-to-day management varies roughly with the proportion of total production represented by dairy products. The rationale of the decision to use data for these two groups of counties is discussed further in a later section.

Specific data used in this paper are in part a byproduct of another research project which has studied mainly broad relationships between the financial organization of farms and their characteristics as capital-using entities.² In that study each of the 108 counties is used as a separate observation. Estimates are made for each county for 1940 to describe. (1) The size and asset structure of farms; (2) the nature and composition of the gross product; and (3) the capital-structure patterns as measured by estimates of amounts and kinds of interests in the assets. Without going into detail, the main point for this paper is that the data from that study are *estimates* for entire counties for 1940. On no other basis is it possible at present to develop a body of comprehensive data that show enough about capital-structure patterns of farms to warrant analysis.

Adaptation of Capital Structure to Uncertainty Arising from Variation in Yields

Because yield uncertainty varies so widely among counties in the Great Plains, selected counties in that region are used to provide a

² A cooperative research project of the Bureau of Agricultural Economics and the National Bureau of Economic Research, Inc. The research report is in the review-draft stage at the time this is written.

The use made of these data in the major research project involved a search for more basic general relationships of capital structure to economic characteristics of the agriculture than those which are only regional in scope. As uncertainty apparently reflects itself in a variety of ways in different kinds of agriculture, no attempt was made in that study to treat uncertainty separately. Instead, discussion of the separate influence of different kinds and degrees of uncertainty was confined to footnotes and appendixes—as possible explanations of the failure of the data to yield entirely consistent relationships of capital structure to asset size, asset structure, and product composition. The illustrations presented here represent an attempt to develop further a part of this footnote and appendix material, with the over-all results of the other project serving as a general framework of reference.

basis for comparisons of farm-capital structures. Available data are not entirely satisfactory for this purpose because estimates must be improvised from fragmentary capital-structure data pieced together from many sources, including special surveys. Accordingly, the analysis is handicapped at the outset not only by the roughness of some of the data but also by having to use a limited number of widely separated counties with only one thing in common—a large proportion of the product throw-off in the form of wheat.³ The location of these counties is shown in figure 1.

The question that immediately arises relates to a statistically feasible method to distinguish among the 24 selected counties as regards probable degree of yield uncertainty. Crop-insurance rates, for example, reflect the judgment of the Federal Crop Insurance Corporation with respect to the rates that should be charged to differentiate among farmers in regard to their proper share of the cost of the insurance pool. But because of certain technical problems in using these data on a county basis, a rather simple statistical device was tried and found to agree fairly well with a number of other general indicators of yield variability. This device is the annual average percentage of wheat acreage abandoned for the years 1926-42. Differences in the percentages are so great that this device appears to differentiate well enough among the 24 counties to warrant the conclusion that the 8 high counties as a group contain agriculture which involve substantially more yield uncertainty than do the 8 low counties.⁴

One difference in the three groups of counties is found in the extent of asset deflation in the 1930's. Comparative data are shown below:⁵

	Group I	Group II	Group III
Percentage of wheat acreage abandoned, 1926-42	34	19	8
Percentage change in value of physical as- sets, 1930-40	-46	-46	-33

³ These 24 counties include all wheat counties for which usable data are available on the several capital-structure items.

⁴ The use of this device involves the assumption that yield uncertainty is likely to vary with extent of crop abandonment.

⁵ In these and all other computations each county is given equal weight in the averages.

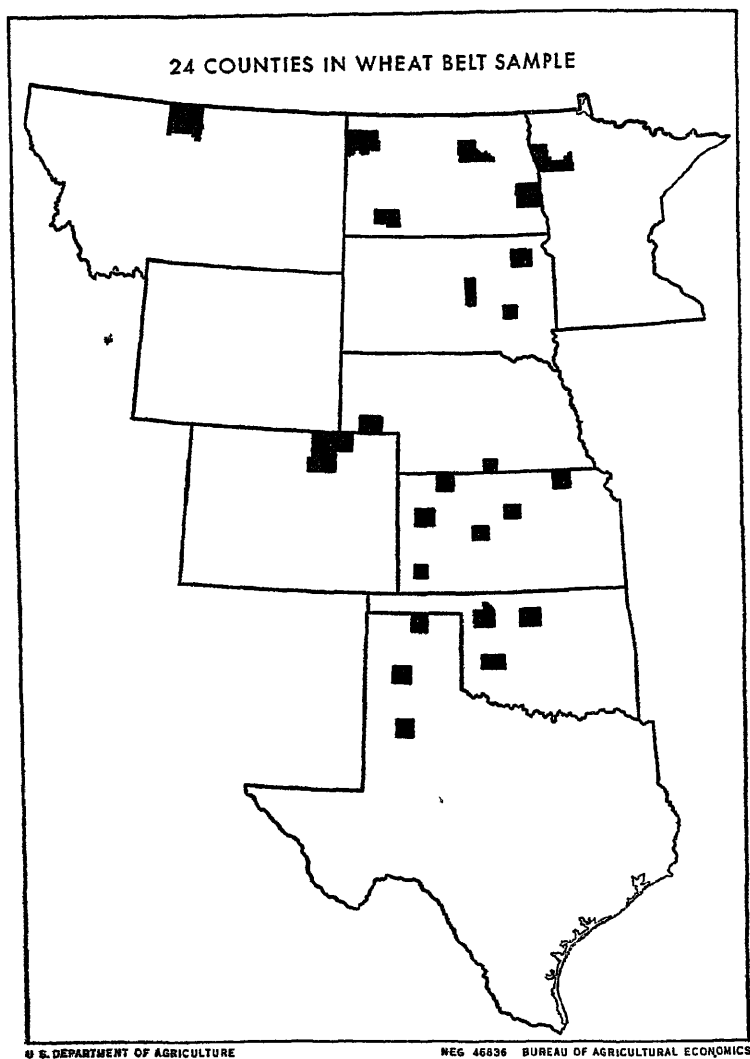


FIG 1

Whether asset value levels were better adjusted in 1930 to long-run yield uncertainty than they were in 1940 is an interesting question on which to speculate. Had asset values declined during the 1930's by about the same percentage for all three groups, it might have

been argued that an allowance had already been made for differences in yield uncertainty in the 1930 values.⁶

But aside from the question of the extent to which the market discounts differences in yield uncertainty in putting values on agricultural assets, the fact that asset deflation was substantially greater in Groups I and II than in Group III complicates direct comparison of the capital-structure patterns of the three groups of counties in 1940. The mere fact that asset values fell 46 percent in two groups and only 33 percent in the third affects the comparability of the 1940 debt and equity items in the capital structures of the three groups of counties. Evidence based on an analysis of the entire 108-county sample, for example, indicates a fairly clear direct relationship between asset deflation in the 1930's and creditor interest in assets in 1940, particularly in the ratio of mortgage debt to the value of mortgaged farms. Operator interests in total assets in 1940, on the other hand, were inversely related to asset deflation in the 1930's. A simple stratification device is used, therefore, to hold average asset deflation relatively constant for the three groups of counties while still classifying the counties into groups by the extent of abandonment of wheat acreage.⁷ This regrouping of counties produces three groups of 8 counties each that still differ sharply in the *average* percentage of wheat acreage abandoned but that are comparable as regards *average* asset deflation in the 1930's. The results of the stratification procedure are shown below.

	Group I	Group II	Group III
Average percentage of wheat acreage abandoned, 1926-42	31	19	11
Percentage change in value of physical assets, 1930-40	-42	-42	-42

⁶ The lack of a difference in asset deflation between Groups I and II lends some support to this view. It may be that the smaller asset deflation in group III reflects in part a less disorganized real estate market in that group in the late 1930's. In this connection it is of some interest that from 1940 to 1945 real estate values alone rose 74 percent in group I, as compared with 55 percent in group II and only 29 percent in group III. It is possible, however, that assets in groups I and II were valued at a relatively too high level in both 1930 and 1945.

⁷ The 24 counties were first arrayed from greatest to least asset deflation in the 1930's. The array was then divided into groups of three, which were then arrayed

For the comparison of capital-structure patterns to be most meaningful, it is desirable also to have the average size and basic business structure of farm firms reasonably comparable by groups. The following indices have been computed to determine to what extent such comparability results from the grouping of counties after stratification by asset deflation in the 1930's.

Indices of asset and product characteristics of farms in 1940	Group I	Group II	Group III
Asset Characteristics			
Average physical assets per farm	\$12,070	\$12,181	\$11,371
Percentage of total physical assets represented by:			
Land	67	61	57
Buildings	12	14	17
Non-real-estate assets	21	25	26
Percentage of total acreage in cropland	59	56	64
Value of farmers' dwellings in 1930 as a percentage of the value of farm real estate in 1930	7	9	10
Product Characteristics			
Percentage of total value of product represented by:			
Crop and livestock sales	79	75	71
Dairy product sales	8	9	10
Poultry, poultry products, and other miscellaneous product sales	4	6	8
Farm products consumed by the farm household	9	10	11
Average number of days off-farm work per farm operator	37	22	19

Average asset size was somewhat larger in Groups I and II than in Group III. Furthermore, in Group I asset composition ran somewhat more heavily to land, and product composition ran somewhat more heavily to crops and livestock (mainly crops) than in the other two groups. But, on the whole, it seems safe to assume that differences among the three groups are not too great to invalidate general comparisons of capital-structure patterns.⁸

separately from high to low according to the average percentage of wheat acreage abandoned in the period 1926-42. The counties with the highest ratio in each of the 8 groups were then combined to form a new group I. Groups II and III were similarly constituted.

Because of the small sample, there is some doubt about the efficiency of any stratification procedure, but it would seem to regroup the 24 counties so that differences in asset deflation among groups of counties would not dominate the comparisons of capital-structure patterns to as great an extent as in the unstratified sample.

⁸ Where appropriate, these differences can be taken account of in the comparisons on the basis of general relationships of asset and product characteristics of agriculture to capital structure found in the study of the entire 108 counties.

Comparisons of the capital-structure patterns of the three groups of counties are limited by available data. The broadest basis of comparison that seems feasible relates to the percentage distribution of interests in physical assets among operators, landlords, and creditors. These estimates are shown below:

Interest in physical assets (percent)	Group I	Group II	Group III
Operators	30	37	38
Landlords	35	35	33
Creditors	35	28	29

The operator interest was lowest in Group I. But from relationships found in the entire 108-county sample, it is not inconsistent to find somewhat lower operator interests in the agriculture with the higher-than-average physical assets per farm, the higher-than-average percentage of assets in land, and the higher-than-average proportion of value of product from crop and livestock sales. The lower operator interest may be accounted for in part, also, by the temporary holding of land by former creditors and by temporarily higher debts carried over from the 1930's. Accordingly, too much weight should not be placed on the fact that operator interests were relatively low in Group I.

But these data give no support to the view that high yield uncertainty forces farm operators to furnish a higher-than-average proportion of the capital invested in agriculture subject to such uncertainty. Greater uncertainty stemming from yield variability apparently does not make it necessary for farm operators to assume greater financial responsibility by owning a larger part of the assets used in such farms. On the other hand, the mere fact that the landlord interest runs as high as it does in Group I suggests that area-wide yield uncertainty does not necessarily repel landlord investment.⁹ Such agriculture may attract considerable equity capital on a speculative basis for somewhat the same reasons that mining ventures often are able to attract speculative equity capital.

From the viewpoint of the distribution of the uncertainty-bearing

⁹ 1940 is too close to the depression years to be most useful for this comparison. In view of this fact, it is of interest that some evidence supporting this observation is found by Mr. E. Lloyd Barber of BAE when data for individual Kansas farms for more recent years are grouped by yield variability classes.

function among investor groups, more information than is now available is needed on the sharing of this function between landlords and operators in the case of tenant-operated farms. Some evidence indicating that landlord investment in the counties with high yield uncertainty was somewhat more in the nature of speculative common stock than was such investment in low yield uncertainty counties can be adduced from certain Census tenure statistics. Comparisons based on methods of rental in the three groups are shown below:

Method of rental	Percentage distribution of value of real estate in tenant-operated farms in 1940		
	Group I	Group II	Group III
	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>
Cash	5 4	9 4	7 9
Cash-share	15 3	35 8	41 1
Share	75 1	51 3	47 8
All other	4 2	3 5	3 2
Total	100 0	100 0	100.0

The most striking point in this tabulation is the high proportion of the value of tenant-operated farms in Group I represented by farms under share lease (about 75 percent as compared with 48 percent in Group III). In 1945 the percentage in farms under share lease in Group I was 77 percent as compared with 52 percent in Group III, which suggests that 1940 was not an abnormal year in this respect.

Data on the relative importance of the part-owner type of farm-business organization in these groups of counties also are revealing. In 1940 about 44 percent of the total farm real estate value in Group I was in part-owner farms, whereas the percentage in part-owner farms in Group III was 35 percent. This also may be a form of adaptation of capital structure to yield uncertainty. The operator may attempt to minimize his own fixed charges by owning only a part of the land he operates and renting land from a nonoperating owner. This tenure arrangement tends to place the uncertainty bearing associated with land ownership upon those who may have greater ability to bear it, thus increasing the efficiency with which this function is performed.

We turn next to the creditor interest in more detail. Selected

data bearing on the real estate credit picture in the three groups of counties are shown below.

Mortgage credit indices in 1940	Group I	Group II	Group III
Percentage of farms under mortgage	58	48	51
Percentage that mortgage debt is of the value of mortgaged farms	49	45	52
Percentage that mortgage debt is of the value of all farm real estate	23	21	24
Percentage of total farm-mortgage debt held by:			
Federal land banks and Federal Farm Mortgage Corporation	72	55	49
Insurance and mortgage-investment companies	5	15	20
Commercial and savings banks	3	4	3
Individuals and miscellaneous lenders	20	26	28

A higher than average percentage of the farms in Group I had mortgage debts but the debt-to-value ratio in Group I was no higher than that for the entire group.¹⁰ The land banks and FFMC held a high proportion of the real estate loans in that group. This may reflect in part the overhang of the refinancing activities of the 1930's, but it seems probable that some difference might be found also in other periods. Insurance companies apparently did not lend heavily in Group I despite the fact that for the entire sample of 108 counties, agriculture with asset and product characteristics like those of Group I shows heavy participation by insurance companies. It seems reasonable to conclude that the greater yield uncertainty in Group I was an important factor influencing these lenders' loan policies. Banks were an unimportant source of real estate credit in all three groups, and private individuals' loans were a lower percentage of total real estate debt in Group I than in Group III.

Agriculture such as that in Group I may attract considerable equity investment by nonoperating individuals, even though it may not attract mortgage loans by such individuals to so great an extent as does that in Group III. It is possible that the mortgage

¹⁰ An hypothesis for further investigation suggested by these data is that high yield uncertainty results in high debt frequency relative to the ratio of debt to value on mortgaged farms. The number of farms under mortgage may reflect mainly the demand for real estate credit, whereas the ratio of debt to value of mortgaged farms may reflect more the supply factor—the willingness of lenders to extend credit. However, the evidence is not clear enough from these data to warrant any definite conclusions on this point.

contract does not provide enough added security to cause investment to follow the debt-financing path in preference to the path of outright equity investment. In agriculture that is subject to great yield uncertainty, the inability of the borrower to live up to the terms of the usual mortgage contract in prolonged periods of low yields may impose disadvantages on lenders not unlike those of equity investors, without giving them the off-setting advantages of participating in the large returns from unusually large yields.

The 1940 figures on mortgage debt doubtless are influenced by developments in the 1930's. But the fact that all private lender groups were less important in Group I than in Group III suggests that the private mortgage contract as such is not very well adapted to shift uncertainty bearing to equity investors in that group of counties. It is possible that agriculture can involve so much uncertainty (or so much of a particular kind of uncertainty) that speculative equity investment by outsiders actually is better adapted to its financing than is conventional private mortgage financing. The mortgage contract may be well adapted to the shifting of uncertainty bearing from capital suppliers to other shoulders only within a certain range of uncertainty or only in connection with particular types of uncertainty situations.

Whereas real estate loans in Group I were about the same percentage of real estate assets as in Group III, the non-real-estate loans of the four lender groups for which data are available were much higher in 1940 in relation to non-real-estate assets in Group I than in Group III (44 as compared with 23 percent). Comparative data are shown below:

	Group I	Group II	Group III
Percentage that non-real-estate loans of principal lending institutions are of non-real-estate assets:			
Banks and production credit associations	44	27	23
FSA and emergency crop and feed loans	17	14	12
	27	13	11

Non-real-estate loans of both types of lenders were high in relation to non-real-estate assets in Group I. Possibly fluctuating yields tend to result in more carry-over loans on the average with the result that some of the capital that should be regarded as long-term investment is furnished, nominally at least, on a short-term basis. At least, a good *a priori* case can be made for the proposition that

in agriculture subject to great yield variability a substantial part of the annual production and living expense should be regarded as potentially long-term investment.¹¹

Although data for any specific date are likely to reflect short-run influence as well as those of a longer run nature, the data for 1940 presented above still may reveal some of the basic relationships of the capital structure of the farm firm to uncertainty that stems from yield variability. No evidence is found to suggest that capital-structure adaptation to high yield uncertainty takes the form of requiring the operator to furnish a larger-than-average proportion of the capital. Nor is there any support for the proposition that nonoperating owners tend to avoid such agriculture. Particular creditors, such as insurance companies, avoid such agriculture, but depression-induced lending beclouds the picture too much to permit any sweeping generalization about the attitude of creditors in general toward such agriculture.

There appears to be a tendency, at least, for agriculture that is subject to high yield uncertainty to develop a capital structure that draws capital from sources peculiarly adapted to bearing the uncertainty that is inherent in such agriculture. In this sense, there is some support for the hypotheses that capital-structure adaptations tend to get the uncertainty-bearing function performed on a relatively efficient basis. Data such as have been presented here, however, throw very little light on such questions as whether agriculture subject to high yield uncertainty tends to be unduly handicapped in obtaining adequate capital from all sources combined. It would seem hazardous to reach any conclusion on this point on the basis of the reaction of particular sectors of the capital market to this kind of agriculture. Hesitation to lend on the part of particular creditor groups may be offset by the willingness of equity investors to finance such agriculture on a basis which gives them an opportunity to share in the profits of the years of high returns.

*Adaptation of Capital Structure to Uncertainty Associated with
the Crucial Importance of Management*

In the previous illustration, the differences in uncertainty for the firm under consideration were those assumed to be associated

¹¹ This point is clearer if the firm maintained large financial reserves to tide over bad years. In bad years a substantial part of this fund would be invested in production and living expenses and in good years more of it would be in liquid reserves. The fund, as such, would be a part of the permanent capital of the business.

mainly with differences in yield variability. In this second illustration, the differences in uncertainty under consideration are those assumed to be associated with differences in the internal characteristics of farm firms that influence the significance of day-to-day management in financial success.

It is true that the human element involved in management is a factor of uncertainty confronting all types of farm firms. But some kinds of agriculture permit rather standardized procedures which can be carried out in routine fashion without much danger that unusually heavy losses will occur as a result of poorer-than-average management. The assets used are such that they are not harmed greatly by poor management, even though current income may be reduced thereby. Large-scale cash-grain farming would seem to rank toward the lower end of the scale measuring uncertainty that is associated with the crucial importance of day-to-day management. At the other end of the scale would be found agriculture in which day-to-day decisions make the difference between success and failure. It is probable that dairy, poultry, fruit and some kinds of specialty crop farming (perhaps tobacco) fall at the upper end of this scale. Success depends, it is true, on good land and other necessary resources, but to a very great extent the way in which the farm is operated spells financial success or failure. Farm firms engaged in this latter type of agriculture are considered here to involve a tendency to high uncertainty which stems from the crucial importance of day-to-day management in financial success.

As in the previous illustration, it is assumed here that uncertainty associated with the management factor varies with objectively measurable characteristics of the firm. It is assumed that farms engaged heavily in operations such as dairying and general farming would involve more uncertainty of this character than would farms engaged heavily in cash field crop production. From the standpoint of yield uncertainty, of course, the reverse might well be true, but here the emphasis is placed on uncertainty that stems from the internal nature of the business rather than from the operation of external forces ¹²

¹² Uncertainty stemming from the one influence does not exist in isolation from uncertainty stemming from other influences. The best that can be done at present in the construction of models for comparative purposes is to choose kinds of agriculture in which yield uncertainty is low but substantial differences are found in characteristics of the agriculture that presumably would give rise to varying uncertainty for the firm because of the management factor

Three Selected Counties

Probable relationships of importance of management to capital structure may be illustrated with data for three individual counties. Green County, Wisconsin, is used to illustrate a kind of agriculture that is characterized by a tendency to high uncertainty for the firm because the kinds of assets used in farming and the concentration on dairy farming make financial success heavily dependent upon day-to-day management.¹³ Garfield County, Oklahoma, is used to illustrate a cash field crop type of agriculture in which the day-to-day management factor presumably is less critical.¹⁴ Delaware County, Iowa, is used to illustrate an intermediate type of agriculture. Indices showing general characteristics of the agriculture in these three counties are presented below.

Indices of asset and product characteristics of farms in 1940	Green County, Wisconsin	Delaware County, Iowa	Garfield County, Oklahoma
Asset Characteristics			
Average physical assets per farm	\$14,584	\$16,511	\$15,244
Percentage of total physical assets represented by			
Land	33	47	69
Buildings	33	28	11
Non-real-estate assets	34	29	20
Percentage of total acreage in cropland	49	65	66
Value of farmers' dwellings as a percentage of the value of farm real estate in 1930	18	14	8
Product Characteristics			
Percentage of total value of product represented by			
Crop and livestock sales	36	62	80
Dairy product sales	50	21	8
Poultry, poultry products, and other miscellaneous product sales	5	8	5
Farm products consumed by the farm household	9	9	7
Average number of days off-farm work per farm operator	13	14	32
Average percentage change in physical assets, 1930-40	-26	-26	-21

¹³ The point needs to be emphasized that in assuming that such agriculture has a tendency to high uncertainty it is not argued that mortality of firms is unusually high. A tendency to high uncertainty need not result in numerous business failures. Adaptations in capital structure and other features of farm organization may offset this tendency. Similarly, in the high-risk wheat counties it is conceivable that a type of business and financial organization better adapted to yield variability might reduce the mortality of farm firms to the average for the country. Still such

As these three counties are "picked" for particular characteristics rather than chosen at random, too much weight should not be given to the specific results.¹⁵ They were selected not only because of wide differences in kind of agriculture but also because both average asset size per farm and asset deflation in the 1930's were approximately equal for all three counties. The average farm for each county thus is comparable as regards both asset size and financial experience in the 1930's. This facilitates comparisons of capital-structure items. Indices of variation in capital structure are shown below:

Indices of characteristics of financial organization of farms in 1940	Green County, Wisconsin	Delaware County, Iowa	Garfield County, Oklahoma
Distribution of interests in assets (percent)			
Operators	47	47	47
Landlords	26	33	36
Creditors	27	20	17
Percentage of farms under mortgage	51	45	44
Percentage mortgage debt of the value of mortgaged farms	62	52	30
Percentage mortgage debt of the value of all farm real estate	34	23	16
Percentage of total farm-mortgage debt held by:			
Federal land banks and Federal Farm Mortgage Corporation	26	26	31
Insurance and mortgage-investment companies	3	39	38
Commercial and savings banks	12	9	12
Individuals and miscellaneous lenders	59	26	19
Percentage non-real-estate loans of principal lending institutions of non-real-estate assets:			
Banks and production credit associations	7	6	13
FSA and emergency crop and feed loans	6	5	11
	1	1	2

The fact that operator interests were 47 percent of total assets in all three counties may or may not be significant. Still, this agrees

agriculture might be said to involve high uncertainty on the assumption of no adaptation to this factor.

¹⁴ This county is one of the 24 counties previously discussed. It had an average abandonment percentage of only 4.3 percent of wheat acreage for the period 1926-42. Accordingly, it cannot be said to be greatly influenced by uncertainty that stems from yield variability.

¹⁵ It should be noted also that the margin of error in the data for individual counties is likely to be larger than for groups of counties, because data for broader areas are used to approximate some of the figures.

with findings in the analysis of the larger 108-county sample which indicate that operator interests tend to vary inversely with asset size of farm. It suggests that the proportion of total assets represented by outside interests (landlords and creditors) may be related more to asset size than to nature of the agriculture.

Although each of the three counties obtained 53 percent of total capital from "outsiders"—(from landlords and creditors),—in Green County, Wisconsin, the landlord and creditor interests were approximately equal, whereas in Garfield County, Oklahoma, 36 percent was landlord interest and only 17 percent creditor interest. These relationships suggest that the loan-contract device may be used more to channel outside capital into agriculture in the dairy county. By this means, uncertainty bearing may be placed more heavily on the operator, who, in turn, presumably is able to influence financial results by day-to-day management policies.¹⁶ Outside capital may flow to agriculture in the cash field crop county to a greater extent in the form of outright equity investment by non-operators, in part because uncertainty there is due more to external forces such as price and yield variations over which neither the operator nor the landlord has much control.

A sharp difference is found between the dairy and the cash-crop county in the ratio of real estate debt to real estate assets—34 as contrasted with 16 percent. Furthermore, nonoperators appear to have invested heavily in the dairy county by lending on mortgages, whereas in the cash field crop county they tended to own the real estate outright. The mortgage contract apparently toned down the uncertainty for individual investors in the dairy county by placing more of the uncertainty bearing on the owner's shoulders. In the cash-crop county outright investors might be in almost as good a position to deal with ownership risks as the operator. Insurance companies, however, avoided the dairy county but loaned heavily in the cash field crop county. Lending risks which are characteristic of the dairy county apparently could be toned down enough by a mortgage contract to attract loans by local individuals, but could not be toned down enough by this means to attract lenders such as insurance companies.

Differences in the asset structure of farms among the three coun-

¹⁶ Those operators who cannot carry the added financial responsibility presumably either are unable to obtain loans or are weeded out as business failures.

ties also may help to explain the differences in capital structures. Where assets consist so largely of buildings and non-real-estate assets, as in Green County, it seems reasonable to expect that day-to-day protection of these assets is very important in their maintenance. The assets of the dairy county could deteriorate very rapidly, with heavy losses for the firm, if not protected by having the financial responsibility rest heavily on the operator's shoulders. Assets in Garfield County, on the other hand, might withstand more neglect, because such a large part of the total consists of cropland and so small a part consists of buildings and livestock.

The tendency for farm firms to control land by the device of the operator renting in land is more pronounced in Garfield County, Oklahoma. In that county 36 percent of the value of all farm real estate was in part-owner farms as compared with 9 percent in Delaware County, Iowa, and 4 percent in Green County, Wisconsin. Farm land probably could be owned in counties such as Garfield by nonoperators as an impersonal investment to be rented to active farmers, whereas in Green County the kind of farming might require that all land used in a farm be an integral part of one business unit. The operator in Green County, therefore, might use mortgage credit to control the necessary resources, whereas in Garfield a rental contract would suffice.

Data on the relative importance of different kinds of rental contracts are shown below:

Method of rental	Percentage of distribution of value of real estate in tenant-operated farms in 1940		
	Green County, Wisconsin	Delaware County, Iowa	Garfield County, Oklahoma
Cash	15 0	26 3	7 3
Cash-share	1 1	19 6	50 0
Share	81 4	51.3	39 1
All other	2 5	2.8	3 6
Total	100 0	100 0	100 0

These data are in contrast to those tabulated for the three groups of wheat counties. Here the county in which uncertainty associated with the crucial importance of management presumably is highest is found to have the highest percentage of tenant-operated land under share rent. Thus there does not appear to be any tendency,

as revealed by these data, for the terms of rental contracts to place heavier financial responsibility on the operator in counties like Green County. Further details on rental agreements, however, might well modify the picture presented by these generalized data.

The foregoing data relating to these three counties do not provide either the detail or the degree of precision required to demon-

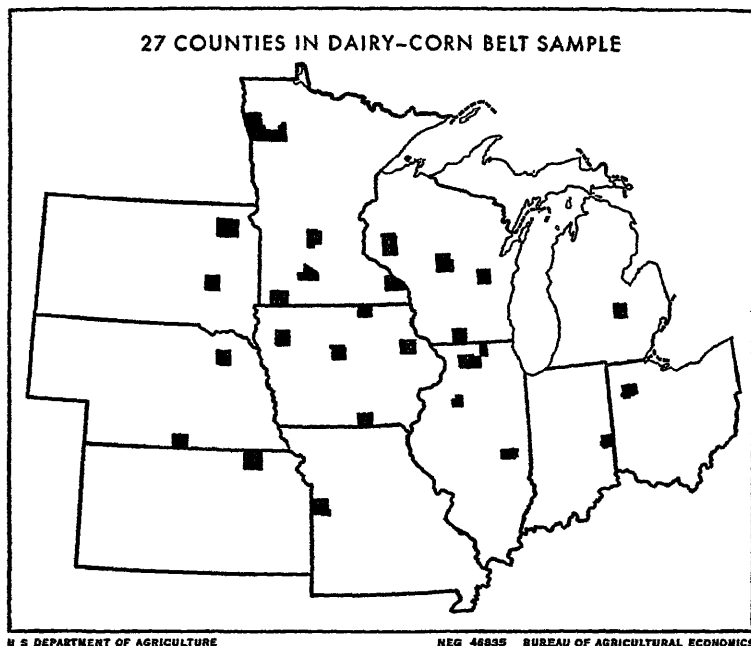


FIG. 2

strate conclusively that farm firms which tend to be confronted with a high degree of uncertainty because of the crucial importance of day-to-day management tend to have capital structures adapted to dealing with this kind of uncertainty. Still, the capital structure as a whole in Green County appears to distribute the capital supply and uncertainty-bearing functions among operators, landlords, and creditors (and among different types of creditors) in a way that tends to associate the functions of uncertainty bearing with the group that is in a better position to deal with its causes. A part of the explanation of differences in tenure and credit arrangements,

when viewed as aspects of the capital structure of farm firms, may thus be found in differences in uncertainty associated with the crucial importance of day-to-day management in financial success.

Three Groups of Counties

Data for groups of counties are difficult to place on a sufficiently comparable basis to permit the same kinds of comparisons that can be made on the basis of the three "picked" counties. In fact, differences in type of farming introduce differences in basic business structure. For these further comparisons, the 27 counties shown in figure 2 are used. To keep the three 9-county groups comparable as regards financial experience in the 1930's, the sample is stratified by asset deflation in the 1930's in the manner described earlier for the 24 wheat counties. After stratification, the *average* percentage reduction of assets during the 1930's was approximately 30 percent for each group. But the three groups are still not comparable on average assets per farm. Data on asset and product characteristics of the three groups of counties are shown below:

Indices of asset and product characteristics of farms in 1940	9 high dairy product counties	9 middle dairy product counties	9 low dairy product counties
Asset Characteristics			
Average physical assets per farm	\$10,493	\$13,508	\$15,328
Percentage of total physical assets represented by:			
Land	41	47	57
Buildings	30	27	19
Non-real-estate assets	29	26	24
Percentage of total acreage in cropland	56	65	66
Value of farmers' dwellings in 1930 as a percentage of the value of farm real estate in 1930	16	15	10
Product Characteristics			
Percentage of total value of product represented by:			
Crop and livestock sales	46	65	76
Dairy product sales	34	16	8
Poultry, poultry products and other miscellaneous product sales	8	8	7
Farm products consumed by the farm household	12	11	9
Average number of days off-farm work per farm operator	21	21	17
Average percentage change in physical assets, 1930-40	-32	-29	-32

In the high-dairy product group (dairy product sales 34 percent of total value of product) average assets per farm are about \$10,500, as compared with about \$15,300 in the low-dairy product group (dairy product sales about 8 percent of total value of product).¹⁷ Accordingly, comparisons of capital-structure items must be made with due allowance for possible independent influences stemming from difference in average asset size of farms among the three groups of 9 counties each. One such effect of the difference in asset size is suggested by the difference in the operator interest in total assets—49 percent for the high-dairy product group as compared with 39 percent for the low-dairy product group shown in the following tabulation:

Indices of financial organization of farms in 1940	9 high dairy product counties	9 middle dairy product counties	9 low dairy product counties
Distribution of interests in assets (percent)			
Operators	49	47	39
Landlords	26	28	36
Creditors	25	25	25
Percentage of farms under mortgage	52	50	47
Percentage mortgage debt is of the value of mortgaged farms	52	47	48
Percentage mortgage debt is of the value of all farm real estate	27	24	22
Percentage of total farm-mortgage debt held by			
Federal land banks and Federal Farm Mortgage Corporation	37	44	40
Insurance and mortgage-investment com- panies	15	24	31
Commercial and savings banks	9	8	6
Individuals and miscellaneous lenders	39	24	23
Percentage non-real-estate loans of principal lending institutions are of non-real-estate assets:	12	15	19
Banks and production credit associations	9	11	15
FSA and emergency crop and feed loans	3	4	4

The interest of real estate creditors in the real estate was 27 percent in the high dairy product group as compared with 22 percent in the low-dairy product group. This is balanced by a re-

¹⁷ A significant part of the adaptation to high uncertainty may take the form of a tendency to smaller farm businesses.

verse relationship for non-real-estate creditors' interests in non-real-estate assets, so that the creditor interest in total assets remains at about 25 percent for all three groups. With asset size more nearly equal for all three groups, the distribution among operator, landlord, and creditor interests probably would conform more nearly to that found for the three individual counties.

As in the three county comparison, individuals were a more important source of real estate loans in the high- than in the low-dairy product group. They held 39 percent of the mortgage debt in the former as compared with 23 percent in the latter. Also, insurance companies held the lower percentage of total mortgage loans in the high dairy product counties.¹⁸

If allowance is made for difference in asset size, it appears that three groups of counties reveal much the same kinds of differences in capital structure that were found in the case of the three picked counties. The capital structure in the group with a high proportion of product from dairy sales appears to be such that uncertainty bearing is placed to a greater extent on the operator. But only small differences are found among the three groups of counties with respect to the importance of the part-owner type of farm business organization. In the high-dairy product group the value of such farms was 15.5 percent of the value of all farm real estate as compared with 18.5 percent in the low-dairy product group. Moreover, as in the three county comparisons, generalized data on method of rental do not indicate any clear-cut differences reflecting a tendency for rental contracts to shift more of the uncertainty bearing to the operator in the high-dairy product group.

The foregoing data for the three individual counties and for the three groups of counties are useful mainly to illustrate possible adaptation of capital structure to the uncertainty facing the farm firm that stems more from the nature of the assets and operations

¹⁸ If insurance companies loaned heavily on the high-dairy product counties, it would be easier to explain the capital structure in these counties in terms of greater stability of income. It could be argued that stability of income not only encourages operators to buy farms on borrowed money but also enables them to accumulate more savings, thus making it unnecessary to rent land to such an extent as in the low dairy product counties. But the fact that neither landlord nor insurance company investment is of much importance in the high-dairy product counties suggests the presence of a kind of uncertainty that is less prominent in cash-grain farming. Local lenders, who are in a position to maintain contacts with their investment may be able to deal with this kind of uncertainty as it affects their investments, whereas large centralized lenders may be able to deal better with moderate uncertainty arising mainly from price and yield variations.

of the firm than from external forces such as weather and prices. One reason why this kind of uncertainty attracts less attention than that associated with yield or price variations probably lies in the tendency for capital structure and other forms of adaptation to be more complete than in the other case. When adaptation is fairly complete the agriculture of an entire area may be generally regarded as "low-risk" agriculture. Still, it is only by recognizing the underlying tendencies to uncertainty that it is possible to understand why the capital structure of such agriculture shapes up as it does.

The reality of the concept of uncertainty associated with the crucial importance of management in financial success might be much more readily recognized under something approaching experimental conditions—for example, if efforts were made to introduce dairy and general farming into areas characterized by farm-capital structures already adapted to cash crop farming. Advantages of stabilizing income by diversification have often been urged as an argument for such changes in farm organization. But it seems probable that such a change would also introduce other elements of uncertainty inherent in the nature of the farming operations and the kinds of assets involved which might require also considerable adaptation of the capital structure. More of the uncertainty-bearing function might have to be placed on those who are in a position to protect the firm against the kinds of losses that result from inadequate day-to-day management.

General Observations

The data presented in this paper may be interpreted from at least three partially independent viewpoints: (1) Their possible bearing on economic theory, with special reference to the role of economic uncertainty in the economic process; (2) questions of methodology raised by the use of county aggregates and averages as a basis for the comparisons; and (3) implications for public policy in relation to agriculture. A few general observations are offered on these three points.

The data suggest a general tendency for the farm-capital structure to adapt to the degree of uncertainty confronting the farm firm. There is some evidence of a tendency for the firm to economize in regard to uncertainty bearing. The prominent part apparently played by landlords as bearers of uncertainty in agriculture

that is subject to high yield variability suggests one kind of adaptation of capital structure that may reduce the cost of uncertainty bearing to the firm. Uncertainty bearing appears to be done more largely by landlords, an investor group that presumably has greater-than-average ability to carry it. However, government also appears to have been a major contributor to uncertainty bearing, as is indicated by loans of federally sponsored credit agencies.

In the case of agriculture that is subject to high uncertainty because of the crucial importance of day-to-day management in financial success, economizing in the performance of the uncertainty-bearing functions appears to have taken the form of associating more of the uncertainty bearing with the investor group that provides the day-to-day management. The operating owner, who tends to bear more of the risk in such agriculture, may be able to hold down the total cost of uncertainty bearing by following management policies that actually reduce uncertainty. The greater importance of local lenders in such agriculture also points to an adaptation of capital structure that associates the residual uncertainty bearing of the creditor with types of investors that may be in a better than average position to reduce uncertainty through direct influence on managerial decisions.

There is no evidence in these data regarding the degree of efficiency in uncertainty bearing that is achieved through such farm-capital structure adaptations. Each of the two patterns of adaptation, however, appear to represent tendencies toward reduction in the cost of uncertainty bearing that conform reasonably well with the nature of the respective uncertainty situations. In most cases it would be expected that a combination of several economizing arrangements would be present. The data used here exaggerate differences in the nature of the uncertainty situation in order to cause any associated differences in capital-structure adaptations to stand out more sharply.

The comparisons also suggest a number of problems, even though they do not provide adequate answers. For example, they suggest that the full effects of uncertainty on capital supply for farms may not be evident from a study of credit supply alone. On the one hand, direct-equity investment by nonoperators may take the place of creditor investment in agriculture that is subject to high-yield uncertainty. Creditor investment may be repelled by deficiencies of the loan contract as a method of shifting uncertainty to other

shoulders. Still, the agriculture may attract nonoperator equity investment in large volume. On the other hand, the mere fact that agriculture that is subject to high uncertainty because of the management factor appears to be able to attract credit in large volume does not necessarily mean that total capital supply is adequate. Such agriculture may be restricted in regard to total capital supply by the limited amount of landlord investment. Nonoperating individuals may invest in mortgages on farms of owner operators in preference to outright farm ownership. Accordingly, data are needed on the supply situations for all kinds of investment in agriculture before we can fully appraise the extent and significance of "capital rationing" in different kinds of agriculture.

The limitations of county data such as are used here for economic analysis have often been noted. Still, such data have some positive advantages when the principal purpose is to explore general patterns of relationships. A substantial body of data that is not available for individual farms can be obtained on a county basis. Furthermore, the county is a large enough unit to permit estimates for items that would have too wide a margin of error if made for individual farms. But in achieving greater coverage of significant items by the use of county data, the chances are greater that important differences in the agriculture will be obscured. Accordingly, such data are more useful when variations by counties in the phenomena to be studied are pronounced, as in most of the phenomena chosen for study in this inquiry.

County data can be used advantageously when the objective of the inquiry is also to test for the presence of clusters of economic relationships that collectively suggest the nature of the economic processes at work. In this inquiry selected items relating to crop records, sources of income, types of assets used, tenure and ownership patterns, agricultural loans, and credit institutions have been used to sketch in important highlights of the phenomena to be studied. But because the meaning of these data depends heavily upon individual interpretation, results necessarily must be subject to divergent interpretations by different research workers. For this reason, the results based on such data must necessarily be extremely tentative pending further testing under different conditions and possibly different assumptions.

Although data presented here do not provide positive answers to questions of agricultural policy, they nevertheless help to point

up some of these questions. For example, does more widespread landlord investment in agriculture that is subject to high-yield variability offer enough in the way of increased efficiency in performing the uncertainty bearing function to require the reconsideration of long-established ideals regarding farm tenure? Are governmental loan programs capable of adaptation to the positive task of providing additional uncertainty-bearing facilities in so-called "high-risk" areas? Does the degree and kind of control appropriately associated with governmental loan programs depend in part upon the extent to which management policies can influence variations in, and levels of returns to, the farm business? Assuming that the degree of capital rationing operating in a particular sector of agriculture is considered too severe, is the loan process the most effective channel through which to induce an added flow of capital to the area? All such questions must draw a part of their answers from facts regarding the relationships of uncertainty in agriculture to the capital market from which agriculture is financed. A few of these relationships are revealed by data such as are included in this paper.

A NOTE ON BILATERAL MONOPOLY, WITH
SPECIAL REFERENCE TO SEASONAL
AGRICULTURAL LABOR

ALEXANDER J. MORIN

I

ANALYSIS of problems of exchange in terms of indifference curves can be used to demonstrate the price and quantity results of exchange in varying situations of competition and unilateral or bilateral monopoly.¹ Situations of the latter type—monopolistic sellers facing buyers in competition, or monopsonistic buyers purchasing from competitive sellers, or single sellers meeting single buyers in one market—are common throughout our economic system. One such situation is examined below—that of exchange between laborers and employing farmers in an industry utilizing seasonal agricultural labor.

Fig. 1 contains two indifference maps, exemplifying certain preference patterns in a particular industry. On the one hand, each point on the indifference curves convex to the origin o at the lower left-hand corner of the diagram (i_0, i_1, i_2, \dots) represents some combination of income received in exchange for leisure given up, from the standpoint of the laborers. On the other hand, each point on the indifference curves convex to the origin o' at the upper right-hand corner of the diagram (e_0, e_1, e_2, \dots) represents similarly some combination of work-hours received in exchange for wage-bill paid, from the standpoint of the employers. All points on any one of the indifference lines represent such combinations as are of equal "satisfaction" to the laborers or employers. The proportions of the "box" in the diagram are determined by the total supply of the items involved in exchange which is in the hands of the parties to the exchange. Thus the line ox in Fig. 1 represents the total amount of leisure which the laborers in this market can give up in

¹ The indifference curve technique was most recently used in the pages of this JOURNAL, to somewhat different purpose, in Southworth, Herman M., "The Economics of Public Measures to Subsidize Food Consumption," this JOURNAL, February, 1945, pp. 48-56. For a full exposition of the technique and its underlying assumptions see Hicks, J. R., *Value and Capital* (Oxford, 1939), Part I, and for a lucid and more detailed example of the particular form of this analysis used in this paper see Wassily Leontief, "The Pure Theory of the Guaranteed Annual Wage Contract," *Journal of Political Economy*, February, 1946, pp. 76-79.

exchange for income, and the horizontal line $o'z$ indicates the total amount of wage-bill which the employers can exchange for work-hours. Both are assumed limited by forces independent of the exchange herein examined, and both are measured in terms of some time period (i.e., work-hours per day, income per day, etc.).

It should be noted that in Fig. 1 the indifference maps represent

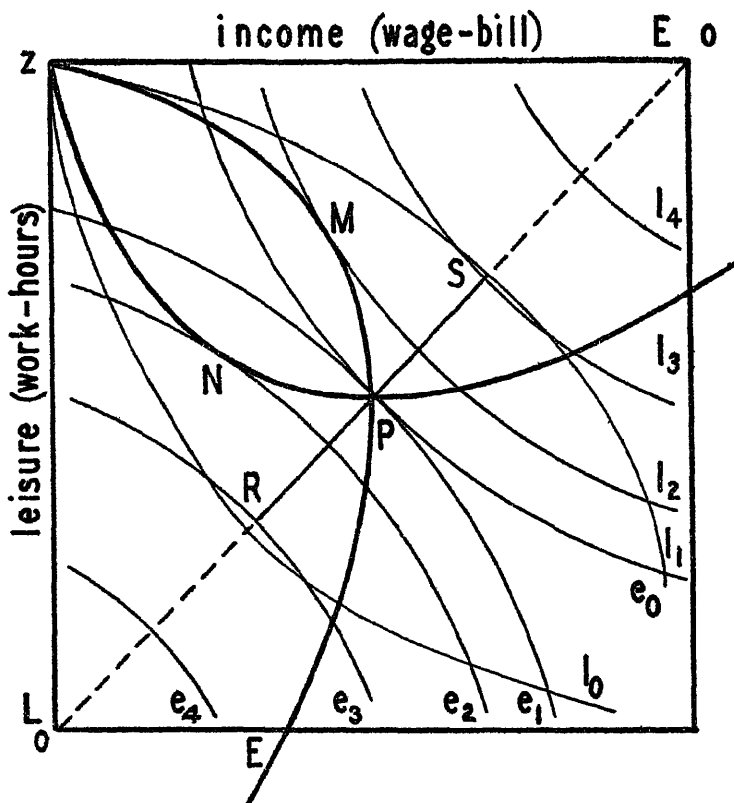


FIG. 1

the preference patterns of a particular industry rather than of particular individuals or firms. This result may be achieved theoretically by taking each map as "representative" of all members of the group in each case, in some sort of average concept. More realistically, it may be assumed that both labor and employers bargain through organizations, and that in this sense the maps represent

the consensus of the preferences of the individual laborers and farmers involved. It is further necessary to make an independence assumption regarding all exchanges other than the one involved here; i.e., labor must be assumed to have a given and finite amount of leisure (oz) which it can (or will) give up *only* in exchange for income derived from the specific employers involved, and the employers must be assumed to have a given and finite amount of money ($o'z$) which they can (or will) give up *only* as wages for hours of work derived from the specific laborers involved. But this study is of wage and employment determination for a single season, and within that period immobilities both in the labor and capital market are sufficiently great to render this restrictive assumption less onerous than it might appear on theoretical grounds.

In Fig. 1, assuming given indifference maps of labor and employers between leisure and income (or between work-hours and wage-bill from the employer standpoint), and with varying ratios of exchange, offer curves zNP and E may be derived for labor and employers respectively. In Fig. 3, for example, the lines r_1, r_2, r_3, \dots represent various exchange ratios between work-hours and wage-bill; the points of tangency of these lines with the employers' indifference curves represent the maximum "welfare" which employers can secure at each such exchange ratio. The line connecting these points (E_1 in Fig. 3, E in Fig. 1), the offer curve for employers, thus shows at varying exchange ratios the size of wage-bill employers will offer for a given number of work-hours; similarly the offer curve for labor shows the amount of leisure which labor will offer for a given amount of income, at varying exchange ratios. From these offer curves traditional Marshallian demand and supply curves for labor or for wage-bill may be derived directly for the industry in question.

Three solutions to the problem of the outcome of exchange between labor and employers are of interest here:

(1) It may be shown that in perfect competition equilibrium in exchange will be reached at the point of intersection of the two offer curves (P , in Fig. 1), where the marginal rates of substitution of leisure and income for labor and of work-hours and wage-bill for employers are equal.² At P indifference curves of the two par-

² For a discussion of the concept of the marginal rate of substitution see Hicks, *op. cit.*, Ch. 1.

ties must be tangent; this and all similar positions may be called "efficient," in the sense that they are positions from which it is impossible to move so as to improve the position of one party without worsening that of the other.³ The point *P* is also one of a range of possible solutions under conditions of bilateral monopoly, examined further below.⁴

(2) If, with indifference maps as in Fig. 1, labor acts with monopoly power against employing farmers in competition, labor can maximize its "welfare" by setting the quantity of leisure it gives up at that point on the employers' offer curve touching its own highest possible indifference curve (i.e., at *M*). Correspondingly, if the employers as a monopsony buy work-hours in a free labor market they can maximize their "welfare" at point *N* on Fig. 1, where their highest possible indifference curve is tangent to labors' offer curve. From an allocative standpoint these are not "efficient" solutions, not lying on the curve connecting all points of tangency of indifference lines of the two preference maps, but no movement away from these points can take place which will benefit both groups involved.

Points *M* and *N* may also be solutions under conditions of bilateral monopoly if one or the other party completely dominates the bargaining between the two. In this sense they may be considered limiting cases, and along the line *MPN* there are a range of solutions corresponding to varying degrees of dominance or subordination on the part of employer or labor groups. At point *P* neither party is dominant; any movement from *P* toward *M* implies increasing dominance of labor, and from *P* toward *N* increasing subordination of labor. Location at any points other than *P*, *M* or *N* must theoretically be an unstable solution; realistically,

³ To the best of the writer's knowledge, the use of the term "efficient" to describe the welfare position defined in the text (above) originated with Prof. Wassily Leontief of Harvard University. It should be noted that it carries no implications of distributive justice, starting with any *given* distribution of income (or wealth, etc.), it merely states that adjustments may be made in that distribution without worsening either party's position up to the point of tangency of two of their indifference curves as in Fig. 1. No judgment may be made as to the relative advantages of two such points of tangency without introducing non-economic considerations as a guide.

⁴ The subsequent discussion to an extent follows that developed by Dr. William Fellner, "Prices and Wages Under Bilateral Monopoly," *Quarterly Journal of Economics*, August, 1947, pp. 503 ff. Dr. Fellner's analysis is in terms of "correspondence curves," based on average cost and average value product schedules for individual firms in a bilateral monopoly relationship, and is therefore less general than the device used here.

this may often be the case in employer-union negotiations, with an unequal balance of power reached and made temporarily stable by collective bargaining agreement.

(3) Collective bargaining may be pursued on an "all-or-none" basis; unions may demand a wage-rate together with a minimum quantity of labor to be employed, and correspondingly employers may demand a rate together with a maximum wage-bill to be paid, with none to be paid at higher rates. A situation of bargaining of this type, in which labor as a monopoly sells work-hours to competitive employer buyers, is graphically illustrated in Fig. 1 at point *S*, in this case labor will offer a given quantity of work-hours at a price such that labor is located on its highest possible indifference curve, subject to the limitation that this point must be on, or or just better than, the employers' zero indifference curve. Along this latter line employers are indifferent as to whether or not they purchase any work-hours of labor at all. Correspondingly, an employer monopsony buying in a competitive labor market would locate at *R*, just above the zero indifference curve of labor. These are "efficient" solutions, inasmuch as any movement away from *S* or *R* will worsen the position of one or the other of the parties to the exchange; at *S* or *R* an indifference curve just above the zero indifference line of one group is tangent to the highest possible indifference curve of the other.

These points are again the limits of a range of possibilities in the case of bilateral monopoly, varying from complete labor dominance at *S* to complete employer dominance at *R*, and *P* is a special case within this range. The line *SPR* has limits set by the zero indifference curves of the two parties to the exchange, and all points along *SPR* equally are "efficient." Solution is indeterminate, with the location of the final result in any specific case and at any specific time depending on the degree of dominance or subordination of one or the other party.

A question may properly be raised here as to the economic objectives of a trade union. In Fig 1 and in the discussion following it is assumed that the significant exchange from the standpoint of labor is between leisure and income, and that on a group bargaining basis a labor union is concerned with maximizing total income (wage-bill) to its membership. Realistically, this may not be the case. Dr. Fellner,⁵ for example, sets up an indifference map for a

⁵ Fellner, *op. cit.*

trade-union between wage-rate and employment, and other alternative goals might fruitfully be considered. Actual collective bargaining situations may include considerations not only of these latter goals, but also may involve the winning of public opinion, the demonstration of power over the opposing party in order to weaken his future bargaining strength, the maintenance of unity within the union, and other elements in addition to pure considerations of the size of the wage-bill. Possibly "income" as plotted on the horizontal axes of Fig. 1 should be construed to refer to a composite, covering a common and properly weighted set of these goals at interest in the bargaining process. But such a notion involves too many complexities and goes too far afield from the principal topics of this paper to be further developed here.

II

The general analysis outlined above has proved particularly fruitful in connection with the investigation of one specific set of collective bargaining problems. In examining the organizing potential of agricultural laborers the special problem of the strength of bargaining position of workers in seasonal crops plays an important role. It is immediately apparent that this strength is subject to wide variation during the year; taking a particular example in the case of apple orchards, demand for labor at harvest time actually may be fifty times as great as during the remainder of the year. During the harvest this demand is inelastic at a high level of employment; this inelasticity is compelled by the great capital investment and high fixed costs involved in the orchard crop together with the perishable nature of that crop. During the off-season demand for labor is relatively elastic at a low level of employment; much of the necessary work is of a type which can be supplied by the farmer himself and members of his family, and generally is so supplied in high-wage periods.

It can be assumed for purposes of this analysis either that this demand is for a work-force of homogeneous composition, or that the union representing labor negotiates without regard to any heterogeneity in skill among its membership (or on the basis of an agreed-upon consensus with regard to such skills). Based on any given set of cost-price conditions, it must also be assumed that at some wage-level the demand curve for harvest labor becomes elastic and has a negative slope.

In Fig. 2 these curves are represented by D_1 for the harvest season and D_2 for the rest of the year. Behind them lie sets of indifference lines for employers, e_0, e_1, e_2, \dots for the harvest season on Fig. 3 and e_0', e_2', \dots for the rest of the year on Fig. 4 (the subscript numbering has ordinal significance only). The indifference map for the inelastic demand curve is such that as the wage-rate

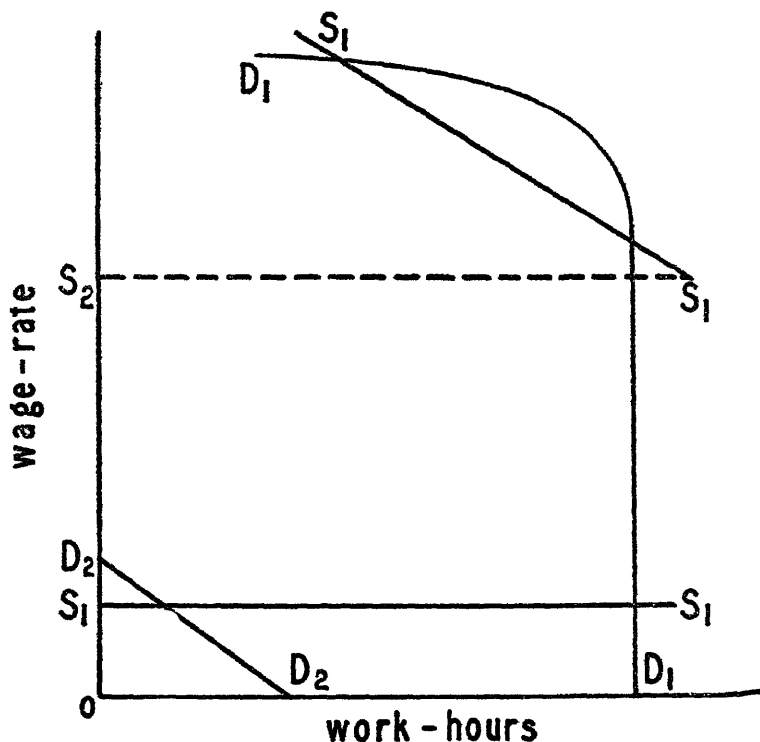


FIG. 2

risks the marginal rate of substitution of wage-payments for a given number of work-hours rises over a considerable range, in order that the number of work-hours demanded remains the same over the corresponding range of wage-rates. The offer curves upon which D_1 and D_2 are based are E_1 and E_2 in Figs. 3 and 4, with the former again reflecting in its straight line section the inelasticity of demand for labor up to very high wage rates.

Except for the war period, empirical observation of the labor market for seasonal farm workers shows it to be composed of a large group of low-income families, freely competing for a relatively limited number of jobs. This would indicate that the supply curve of such labor in its simplest form might be assumed to be perfectly elastic at a low wage rate, this implies a straight-line indif-

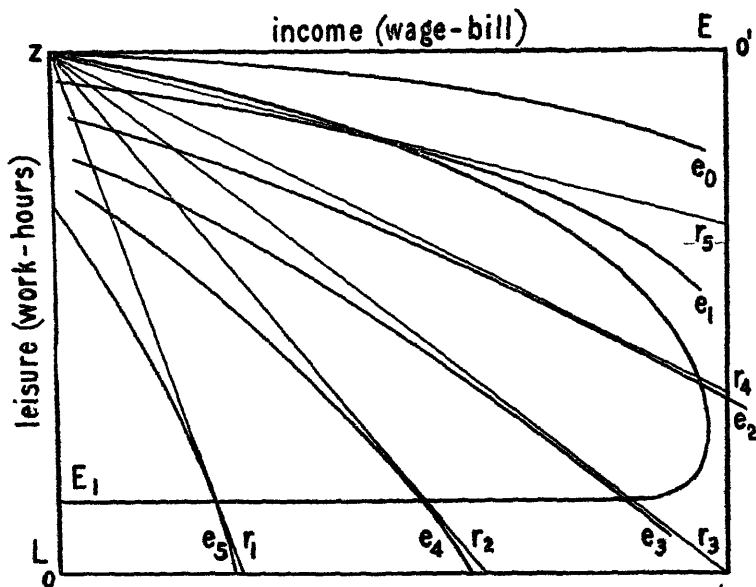


FIG. 3

ference curve and offer curve identical with any given rate of exchange between leisure and income from wages. But the war period, which for several reasons had the effect of giving the supply curve positive slope, also indicated that above a certain wage it began to develop a markedly negative slope. This was particularly true in the seasonal agricultural industries in question, where much of the labor force is normally composed of women and children; these latter groups leave the force in increasing numbers as their prosperity grows.⁶

⁶ There are some empirical indications that at still higher wage levels, approaching those of competing urban occupations, the supply curve again rises upward and to the right

In normal times, however, this area of negative slope has not been a significant factor. The disorganization of the labor market and the over-supply of seasonal farm labor available have made the elastic range of the supply curve the only section relevant in actual exchange. Accordingly the labor supply curve (S_1) is shown in Fig. 2 as of two discontinuous sections, one perfectly elastic at a low

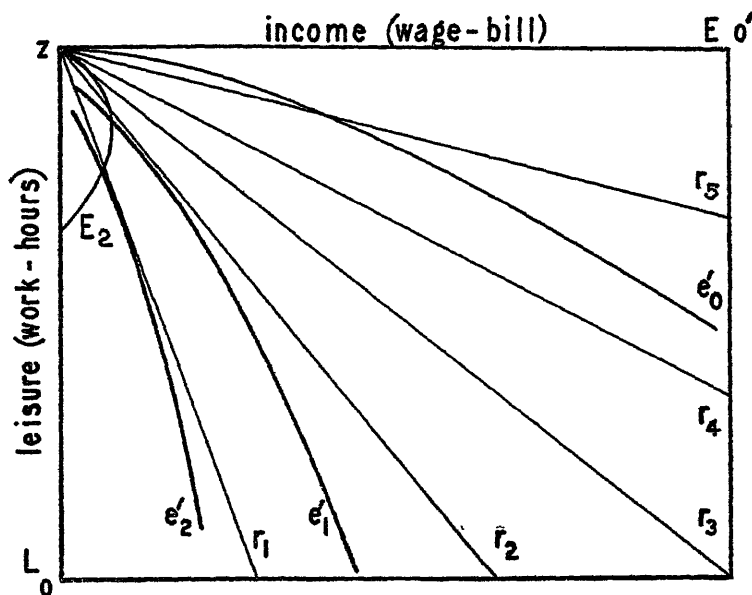


FIG. 4

wage and the other with negative inclination at higher wage levels. Fig. 5 indicates the nature of the indifference map and offer curve upon which this supply curve must be based. Within the area bounded by exchange ratio lines zr_1 and zr_3 there is, strictly, no offer curve as such; any amount of labor would be offered at any given exchange ratio within that range.

On Figs. 6 and 7 the two employer offer curves of Figs. 3 and 4 and the offer curve of labor of Fig. 5 have been superimposed, together with the zero indifference lines in each case (e_0 , e_0' , and l_0 ; the latter is just lower than the exchange ratio zr_1 which itself is identical with the first section of labor's offer curve, L).

It may be noted at once from Fig. 6 that so far as the employers

are concerned, the assumption of perfect elasticity of supply of labor freely competing for jobs immediately grants them (the employers) the maximization of their welfare position, under any given indifference map for labor. This is true regardless of the degree of monopoly power possessed by the employers, since with no limitation on the quantity of work-hours made available at

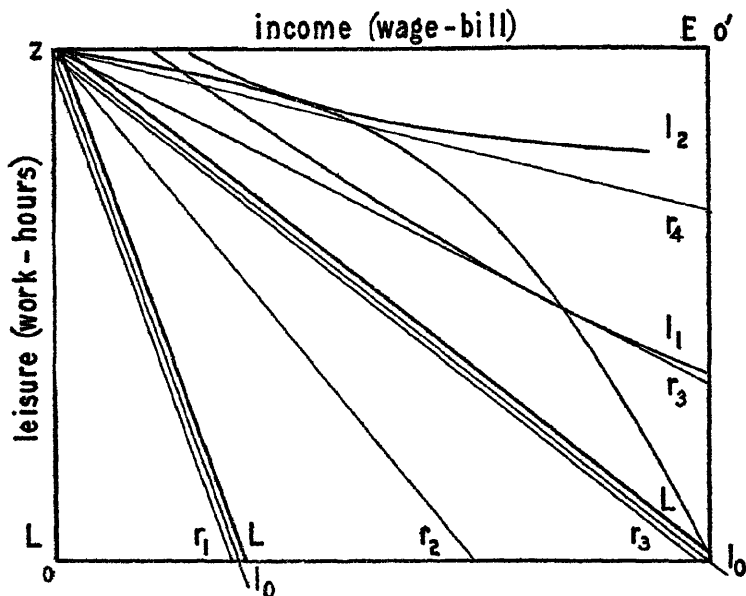


FIG. 5*

* The exchange ratio lines should be numbered consecutively from the left, r_1 , r_2 , r_3 , r_4 , r_5 , r_6

any price labor itself will force the exchange ratio down to a location just above their own zero indifference line when confronted with an arbitrarily limited demand for their services. It will be remembered from the earlier discussion that this location is that reached by a monopoly employing an "all-or-none" sales technique, in this case the latter solution is identical with that for a monopoly not bargaining on this basis, since the relevant exchange ratio is identical with the first section of labor's offer curve. But further examination, following the lines of the earlier discussion, reveals some complications:

(1) The case of perfect competition on both sides of the exchange

results in equilibrium at P_1 (Fig. 6) during the harvest season and P_2 during the rest of the year. The employers have no incentive and labor no ability to raise the exchange ratio above these points within the range of indeterminacy zr_1 to zr_3 . But it is by no means certain that these points are also possible solutions in the case of bilateral monopoly, with or without "all-or-none" bargaining. An

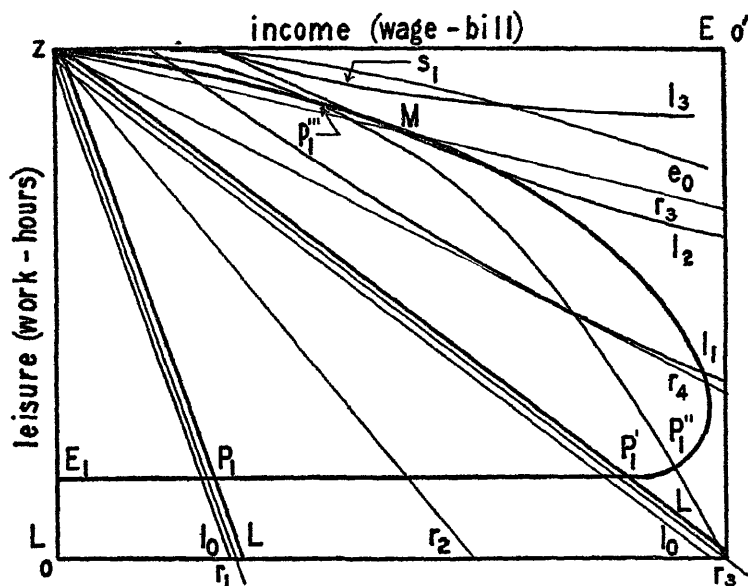


FIG. 6*

* The exchange ratio lines should be numbered consecutively from the left, r_1 , r_2 , r_3 , r_4 , r_5 , r_6 .

immediate effect of union organization may be to raise labor's zero indifference line from zr_1 to zr_3 , in order to bring the second, negatively-sloped section of labor's supply curve into relevance (i.e. to shift labor's supply curve from the discontinuous function $S_1S_1-S_1S_1$ in Fig. 2 to the curve $S_2S_1S_1$).

The effect of this change would be to raise the exchange ratio of leisure for income (work-hours for wage-bill), shifting the outcome of the exchange from P_1 to P_1' without changing the amount of leisure given up by labor in the harvest season. Other solutions are possible (i.e., P_1'' , P_1'''), all equally "efficient," since they are intersections of offer curves and points of tangency of indifference curves,

situation described. The inelasticity of employer demand for labor prevents their taking advantage of the elasticity of supply of labor beyond the point of intersection of their offer curve with that of labor; and the offer curve of labor over at least part of its range lies just above labor's zero indifference line, i.e., it is identical with the maximum possible "welfare" position of employers. The only significant effect of employer monopsony, if it dominates a union monopoly on the supply side, is to prevent the latter from raising the price of labor above this position.

On the other hand, a monopoly of labor may raise the exchange ratio of leisure and income, and thus labor's welfare position, to that point where the employer offer curve is tangent to labor's highest possible indifference curve. In Fig. 6, in connection with the harvest season only, this point is at M , on the backward-sloping section of E_1 . Thus the limiting solutions in the case of unilateral monopoly or monopsony, or bilateral monopoly where one or the other party completely dominates the bargaining, are M in the case of labor monopoly or domination, and P_1 in the case of employer monopsony or domination. There are in Fig 6 as drawn four equally "efficient" and stable solutions (see discussion of first case); all other points are stable equilibria only insofar as they are fixed for a period of time by contract.

(3) As has already been noted, an employer monopsony bargaining on an "all-or-none" basis can reach no results different from those of pure competition, simple unilateral monopsony, or employer dominance in the case of bilateral monopoly. The employers' maximum welfare position in each of these cases remains P_1 in the harvest season and P_2 (Fig. 7) for the off-season of employment. But a labor monopoly can make further gains, by locating its exchanges at that point just within the employers' zero indifference curve tangent to labor's own highest possible indifference curve. In Fig 6 these points are represented by S_1 for the period of high employment and in Fig. 7 by S_2 , at a lower wage, for the slack season. All such bargains must be at points of tangency of indifference curves and therefore "efficient" solutions, in this case the line connecting such points follows the straight-line section of the employers' offer curve in Fig. 6 and from there a path from P_1'' through P_1''' to S_1 . All points of possible solution in the "all-or-none" case are along this line, with the final result in any specific case and at any given time depending on the degree of dominance

or subordination of one or the other party.

The difficulties involved in the separate seasonal demand schedules may be handled by unions in any one of several ways: (1) they may use the technique of wage discrimination, proposing a lower rate for off-season employment than for peak periods (i.e., locating at P_2 in the slack and P_1' or even S_1 in the peak); (2) they may attempt some compromise rate (as one intermediate between zr_1 and zr_2) in an attempt to maintain some employment for their members during the entire year without unduly complicating their rate structure; (3) they may concentrate their efforts on maximizing the rate during the harvest period (at S_1), ignoring the problem of slack season employment as of little consequence.

Historically, the difficulties of organization of farm workers and of maintaining such organizations over time have been such that the few unions attempting it have generally followed the last of these courses. The Industrial Workers of the World (I.W.W.), for example, concentrated its whole organizing force on farm workers during the harvest season, when it was possible to achieve phenomenal gains; at the conclusion of this period, the union hibernated until the following season again offered opportunity for the exercise of their strongest bargaining weapons. Generally they seem to have operated within the range of inelasticity of demand for labor, and thereby involved their membership in no loss of employment. The great and widely-expressed fear of farm employers, however, has been the possibility of the formation of unions strong enough to take full advantage of their monopoly position, and drive the employers to a no-profit situation season after season.

In summary, analysis indicates that the peculiar demand and supply conditions in the market for seasonal agricultural labor, while to this time resulting in the relatively disadvantaged status of farm workers, hold potentialities of considerable gains by organizations with effective control over the labor supply. These gains may in large part be made without diminishing employment, and may be most effectively concentrated during the peak of seasonal employment. For employers, however, the present situation in the labor market cannot, on theoretical grounds (and referring to the pre-war situation as normal), be bettered, and the principal function of their organization into monopsony forms in this market would be (and in fact has been) to check the development of monopolies on the labor side.

III

The limitations inherent in this type of analysis are apparent in the restrictive assumptions upon which it is based. To some extent, also, the argument may violate Wicksell's dictum that "it is not the proper purpose of science to describe the obvious in elaborate terms."⁷

Nonetheless, analytical abstraction of this nature has considerable value in indicating limits and directions for further study. In the particular case at hand, the starting-point of the analysis lay in demand and supply curves determined by observation of reality. The nature of these curves presupposed certain forms of offer curves, and behind these certain configurations of preference patterns. But in deducing the latter, an abstract apparatus is developed which can serve as a guide and basis for further logical analysis and further research into the problem at hand.

Specifically, among the unanswered questions remaining are the precise nature of trade union and employer goals (i.e., the content of the indifference maps and the factors affecting them), the location of the critical turning points of the offer curves (and therefore of the demand and supply schedules), and the location and shape of the zero indifference curves. The selection of such problems as these must be based on some analytical framework; their relevance to the issue under examination is the test of the usefulness of that framework.

⁷ Wicksell, Knut, *Lectures on Political Economy*, Vol I, p. 19.

RECOVERING THE INVESTMENT IN LIMESTONE*

With Particular Reference to Reimbursement of Vacating Tenants

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INVESTMENTS in soil improvement are of increasing importance in farming. Among these, limestone occupies a major role, largely because it helps to increase the flexibility of farming systems. Many of its benefits are of a secondary nature. For example, lime makes possible the growth of certain legumes, and the yields of other crops are increased primarily as a result of the legumes in the rotation. In this paper, benefit from liming is expressed as the value of increased crop yields. The secondary benefits that result from increased livestock production are excluded.

A more quantitative evaluation of yield response is needed to help in guiding credit and repayment policies relating to investments in limestone, and to determine the reimbursement of tenants for the unexhausted portion of investments they have made. The persistence of response from limestone depends on many factors. These include rate of application, soil and climatic conditions, the farming system, and associated practices. It is usually much longer than the period over which the investment is customarily depreciated as a basis for reimbursement of tenants, or for other purposes. For owner-operated farms the question of the time period is of importance for land-inventory purposes. Another reason for this type of evaluation is that analysis of response to limestone and to many other soil-improvement measures is essential to a determination of economic levels of expenditures for soil conservation.

The problem is of added significance if the investment has been made by a tenant who leaves the farm before the value of the investment is exhausted. Whether it is appropriate to write off the investment over an arbitrarily fixed period depends upon the ratio of benefits to costs during that period. This in turn varies with soil and climatic conditions, the cropping system, and the level of

* The data on which this analysis is based were supplied by Dr. F. C. Bauer, Illinois Agricultural Experiment Station. Mr. Fred L. Garlock, Bureau of Agricultural Economics, furnished some very helpful suggestions.

prices. If the method by which the reimbursement is calculated is geared more nearly to the time period over which substantial benefits may be expected, the tenant has greater assurance that he will receive an appropriate return. Such a method requires the use of data showing the annual yield response of different crops to lime over a period of years, for the cropping system, and for the soil and climatic conditions under which the schedule of reimbursements is to be developed. A method of reimbursement based on a careful appraisal of the residual value of soil-improvement investments should lead to better farm practices, and in turn, to longer periods of tenure.

Problems in Handling Lime Response Data

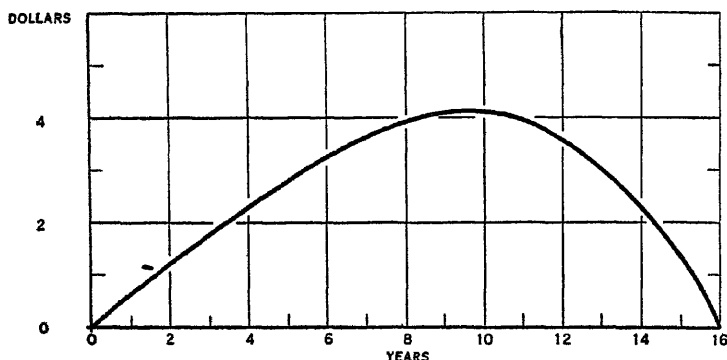
Data supplied by the Illinois Agricultural Experiment Station, based on work at the West Salem Experimental plots, are used to establish a curve of residual effect. The soil is of low natural productivity, yellow, with a non-calcareous sub-soil. Five series of plots, each carrying a 5-year rotation of small grain, a legume crop, small grain, and corn followed by another legume crop, are available for the comparison so that each year furnishes data for a complete rotation. The comparison is between two plots for each of the five series, one of which was limed in 1912 at the rate of 4 tons per acre. The other plot received no lime. Aside from the liming, the plots were treated alike, with no other soil treatments. Average annual yield differences between limed and unlimed plots for the five series were used as the measure of response.

One of the problems encountered is that of smoothing out annual differences in yields that must be attributed to factors other than the residual effect of the lime. Variations in weather conditions greatly affect the response. A series of 6-year averages of the annual value of the increases in crop yields seemed to give the best basis for a smooth curve (figure 1) to represent the response from limestone over a period of years. The curve is drawn freehand in a way that appears to fit the 6-year average annual value of the increases in yields, as shown in table 1. This table also shows the number of yield observations for each crop, for each 6-year period.

There are a number of limitations to the data in this experiment for purposes of developing a schedule of reimbursements that is consistent with current farm practice. First, conditions that existed in this experiment probably do not represent what would be recom-

mended for good farming today. No manure, or other soil treatments were applied and all of the crops were removed. As the data are not current they may not reflect accurately the response that

VALUE OF ADDITIONAL CROP YIELDS PER ACRE RESULTING FROM A SINGLE APPLICATION OF LIMESTONE, WEST SALEM, ILLINOIS



U. S. DEPARTMENT OF AGRICULTURE

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BUREAU OF AGRICULTURAL ECONOMICS

FIG. 1

TABLE 1. NUMBER OF YIELD OBSERVATIONS, BY CROPS, AND AVERAGE VALUE OF INCREASE IN YIELDS PER ACRE FOR EACH OF THREE 6-YEAR PERIODS

6-year period	Number of crops on 5 series of plots				Average annual value of increase yields per acre ²
	Corn	Oats	Legume ¹	Wheat	
1 (1912-17)	Number 6	Number 7	Number 12	Number 5	Dollars 1.75
2 (1918-23)	6	6	12	6	4.11
3 (1924-29)	6	6	11	7	1.80

¹ The legume crops consisted of both soybeans, and clover, some of which was harvested as seed, and some as hay.

² Prices used for corn, oats and wheat are \$0.85, \$0.50, and \$1.20 per bushel, respectively. A price of \$13.00 was used per ton of hay and per bushel of clover seed. Soybeans for beans were figured at \$1.70 per bushel.

could be expected at the present time. Also, the rate of 4 tons per acre may, under many conditions, be less profitable than, say 2 tons applied more frequently. For these, and perhaps other reasons, the analysis presented here should be considered as illustrative of a method rather than as an accurate description of results that might

be expected under present farm conditions. There is need for data that measure the residual effect of limestone, and of other soil improvements, under generally recommended good farming practices. The question of the relative profitability under different conditions, of making smaller and more frequent, versus larger and less frequent applications of coarser material, may be in need of further testing. It is a question which greatly affects the initial investment, and the period of time over which benefits will occur.

A Suggested Reimbursement Plan

Once the curve of residual effect is determined, the value of past and future benefits at constant prices, may be computed for each year of the period. In the case of the tenant-owner contract, the reimbursement should cover the tenant's share of the investment less depreciation, so that he would retain his share of the net returns obtained during his tenure.

This principle is illustrated in table 2 in which is shown the tenants investment compounded annually, his share of returns computed from the total returns read from the curve of figure 1, and a suggested basis for calculating reimbursements in case he leaves the farm. Past costs and returns are compounded at 4 percent, future returns are discounted at the same rate. Returns are calculated over the entire period indicated in figure 1. A percentage relationship between remaining and total benefits is then established for each year of the period. This percentage (Col. 6) of the investment cost is used to calculate the reimbursement. The reimbursement therefore does not necessarily represent the total residual value of the limestone. For example, the tenant's future returns, which truly reflect the residual gross value of his portion of the investment, are always greater than the reimbursement. The difference between the two represents the gain to the owner, after reimbursing the tenant, as by this transaction, the owner acquires the right to what was previously the tenant's share of the future benefits. But the reimbursement plan should not require the owner to pay more than the original cost of the investment, compounded, times a percentage figure that is believed to represent the proportion of its total income yielding power that remains.

It is not until the eighth year that the value of the tenant's past gross returns exceeds his share of the cost. The reimbursement is calculated so that the tenant bears his share of the depreciation.

TABLE 2. TENANT'S INVESTMENT AND RETURNS PER ACRE FROM LIMESTONE, AND SUGGESTED BASIS FOR REIMBURSEMENT

Year	Tenant's investment cost	Tenant's share of value of increases in yields			Ratio of future to total returns	Calculated reimburse-ment	Realized returns	Net final returns
		By years	Past	Future				
	1 ¹	2 ²	3 ²	4 ³	5	7 ³	8 ⁴	9 ⁵
1	8.74	0.86	0.37	18.41	18.78	8.57	-8.97	0.20
2	9.09	0.72	1.14	18.44	19.58	8.56	-7.95	0.61
3	9.45	1.05	2.37	18.18	20.40	8.40	-7.18	1.22
4	9.83	1.38	3.80	17.46	21.26	8.07	-6.03	2.04
5	10.22	1.68	5.70	16.40	22.19	7.59	-4.52	3.07
6	10.63	1.95	7.86	15.20	23.16	6.97	-2.67	4.30
7	11.05	2.19	10.56	13.62	24.18	6.22	-0.49	5.73
8	11.50	2.37	13.44	11.80	25.24	5.37	1.94	7.31
9	11.96	2.47	16.53	9.80	26.33	4.45	4.57	9.02
10	12.43	2.47	19.76	7.73	27.49	3.49	7.83	10.82
11	12.93	2.37	23.02	5.66	28.63	2.55	10.09	12.64
12	13.45	2.16	26.19	3.73	29.92	1.63	12.74	14.42
13	13.99	1.83	29.13	2.05	31.18	0.92	15.14	16.06
14	14.55	1.38	31.75	0.75	32.50	0.33	17.20	17.53
15	15.13	0.78	33.83	0.00	33.83	0.00	18.70	18.70

¹ Three-fifths of total cost of 4 tons of limestone at \$3.50 per ton, compounded at 4 percent.² Three-fifths of total value of increased yields. Past and future returns are compounded, and discounted at 4 percent, respectively.³ Column 6 times the investment cost, column 1.⁴ Column 3 minus column 1.⁵ Sum of columns 7 and 8.

For example, if the tenant leaves the farm at the end of the fifth year his gross returns would be \$5.70. This added to the reimbursement of \$7.59 gives a total of \$13.29. But his cost at that time is \$10.22 so that his return after reimbursement would be \$3.07 (col. 9). The difference of \$2.63 between the tenant's past gross returns (\$5.70) and his net final return after reimbursement (\$3.07) is his share of the depreciation. The depreciation may also be calculated as the difference between column 1 and column 7.

The principle as illustrated here is based on sharing the initial investment between the owner and tenant in the same proportion as they share in the returns. This appears to be the most feasible way in which the principle may be applied. For example, if the tenant makes all of the initial investment, the reimbursement would need to include not only the residual value of the entire investment, but also an amount that would represent the owner's proper share of the depreciation. This would mean that during the latter part of the period, the reimbursement would exceed the value of the total future returns. During the period the tenant remained, the owner would have received a share in the returns without sharing in the cost. A similar situation would occur if the owner had made all of the initial investment, except that, on leaving, the tenant would be indebted to the owner for the past benefits he had received. Unless both parties are willing to share in the initial investment, it is unlikely that either of them, on termination of the lease, would be willing to reimburse the other for past benefits received without cost.

Effect of a Lighter Application

It was pointed out earlier that the rate of application in this experiment, was heavier than that customarily used where liming is practiced in the farming system. Even though experimental results show a benefit over a long period, there may be question as to the practicability of reimbursement plans that extend over a period of from 10 to 15 years. The question of risk, and the uncertainty as to the nature of the farming system over this long a period may operate to prevent owners and tenants from entering into contracts of this duration. In some cases rental arrangements are stable and both owners and tenants recognize the fact that heavy applications of limestone represent capital investments from which re-

TABLE 3. TENANT'S INVESTMENT AND ESTIMATED RETURNS FROM A 2-TON APPLICATION OF LIMESTONE AND CALCULATED REIMBURSEMENT

Year	Tenant's investment cost	Tenant's share of value of increases in yields				Ratio of future to total returns	Calculated reimbursement	Realized returns	Net final returns
		By years	Past	Future	Total				
	1 ¹	2	3	4	5	6	7	8	9
1	4.37	0.86	0.97	7.01	7.98	95.0	4.15	-4.00	0.15
2	4.54	0.72	1.14	6.58	7.72	85.2	3.87	-3.40	0.47
3	4.72	1.05	2.27	5.80	8.07	71.8	3.39	-2.45	0.94
4	4.91	1.38	3.80	4.64	8.44	55.0	2.70	-1.11	1.59
5	5.11	1.68	5.70	3.15	8.85	35.6	1.82	0.59	2.41
6	5.31	1.95	7.96	1.83	9.29	14.3	0.76	2.65	3.41
7	5.52	1.38	9.71	0.00	9.71	0.0	0.00	4.19	4.19

¹ Three-fifths of total cost of 2 tons of limestone at \$3.50 per ton, compounded at 4 percent. (Data for other columns derived as in table 2).

turns are as real as are those from other farm improvements such as buildings. Under these conditions, and where there is evidence that heavy applications less frequently made, are profitable, long term reimbursement plans are thoroughly justified.

But generally, a time period of the length illustrated in table 2, will not find ready acceptance. Therefore, an adaptation of the data is made in order to illustrate what the situation might be with an application half as large. In this case the assumption is that the annual benefits up to the time they begin to decline, will be the same as when 4 tons are applied. This assumes that the heavier rate was double the quantity needed to bring about the optimum soil reaction, or to supply as much lime as the plants would use each year. It is probable that a larger proportion of the lime would consist of the finer particles, if the lighter application were used. Only a part of any application will become effective each year, the balance remaining as unused material for future use, or some may be lost through leaching depending on the type and fineness of material applied and on soil and climatic conditions. There may be question as to whether table 3 expresses the response that would be obtained from 2 tons of limestone, under conditions similar to those which gave the response indicated in table 2 when 4 tons were applied. However, table 3 is shown in order to illustrate a reimbursement schedule that more nearly conforms to the general practice of applying lime not less frequently than from 7 to 10 years.

If table 3 is assumed to represent the effect of only 2 tons of limestone applied under conditions of the experiment, the tenant's past gross returns will exceed his cost in the fifth year. This is 3 years earlier than when 4 tons are applied, because the annual benefits are assumed to be the same until they have reached the maximum, while the cost is only half as much as for 4 tons. But the benefits from 2 tons are assumed to cease at the end of the seventh year. As in the case of table 2, the value of future returns is always greater than the reimbursement.

Position of Tenant and Owner

The position of both tenant and owner is shown in table 4 for each year of the period over which a reimbursement would be made in case the tenant leaves. Net returns shown in this table are derived by subtracting the cost, compounded, from the sum of all past and future gross returns. The reimbursement has been added

TABLE 4 POSITION OF OWNER AND TENANT AT THE END OF EACH YEAR DURING THE PERIOD OVER WHICH REIMBURSEMENT WOULD BE PAID

A. Based on a 4-ton application (table 2)

Year	Owner's gross returns at the end of each year ¹		Owner's share of cost	Value of past and future net returns			
	Past compounded	Future dis-counted		Tenant leaving		Tenant remaining	
				Tenant	Owner	Tenant	Owner
	1	2	3 ¹	4 ²	5 ³	6 ⁴	7 ⁵
1	0 25	12 27	5 83	0 20	16 53	10 04	6 69
2	0 76	12 29	6 06	0 61	16 87	10 49	6 99
3	1 52	12 08	6 30	1 22	17 03	10 95	7 30
4	2 53	11 64	6 56	2 04	17 00	11 43	7 61
5	3 80	10 99	6 82	3 07	15 87	11 97	7 97
6	5 31	10 13	7 09	4 30	16 58	12 53	8 35
7	7 04	9 08	7 37	5 73	16 15	13 13	8 75
8	8 97	7.86	7 67	7 31	15 59	13 74	9 16
9	11 03	6.53	7 98	9 02	14 93	14 37	9 58
10	13.18	5 15	8 29	10 82	14 28	15 06	10 04
11	15 35	3 77	8 62	12 64	13 61	15 75	10 50
12	17.46	2 49	8 97	14 42	13 03	16.47	10 98
13	19.43	1 36	9 33	16 06	12 59	17 19	11 46
14	21 16	0 50	9 70	17 53	12 38	17 95	11 96
15	22 55	0.00	10 09	18 70	12 46	18.70	12 46

B. Based on a 2-ton application (table 3)

1	0 25	4.68	2 91	0 15	4.88	3 01	2 02
2	0 76	4.39	3 03	0 47	4 83	3 13	2 12
3	1.52	3 86	3 15	0 94	4.64	3 35	2 23
4	2 53	3 09	3 27	1.59	4 29	3 53	2.35
5	3 80	2.10	3 41	2 41	3 82	3 74	2.49
6	5 31	0.88	3 54	3 41	3 22	3 98	2.65
7	6.48	0.00	3 68	4 19	2 08	4 19	2.80

¹ Owner's share (2/5) of total returns and of investment cost² Net final returns after reimbursement, from column 9 of tables 2 and 3³ Owner's total returns plus tenant's future returns, less sum of reimbursement and owner's share of cost⁴ Tenant's past and future returns less cost.⁵ Owner's past and future returns less cost

to the tenant's gross returns and to the owner's costs, in computing net returns to the tenant and owner, respectively, when the tenant leaves.

As has been pointed out, the owner's net returns after reimbursing a vacating tenant, include the future returns the tenant would have received had he remained. This presents a problem to the owner in working out arrangements with a new tenant. Unless he

can shift the reimbursement cost to the new tenant, he will have paid for the right to returns he will not receive. This would put the owner in a position somewhat comparable to that of the tenant who is not paid for an unexhausted portion of the investment. This presents another angle to the question, and emphasizes the need for more accurate data on response to and residual effects of soil improvement measures. Only after enough good data are accumulated, and the analysis given popular treatment, can there be general recognition and sanction by custom or law, of satisfactory arrangements for the division of costs and benefits. The same can be said with regard to the problem of sharing the costs of soil conservation measures between the individual and the public. This is a policy decision to be made by elected representatives. But a more solid basis than now exists is needed as a guide in making the decision.

What the vacating tenant sacrifices, even under the plan suggested, is seen by comparing columns 4 and 6 (table 4), the latter including the discounted value of all future net returns he would receive if he remained throughout the period of residual effect. Columns 6 and 7 of this table show that if the tenant remains throughout this period, he and the owner share in the returns in the same proportion as they share in the investment. However, if the tenant leaves before the value of the investment is exhausted, the ratio of his returns to the total returns will be less than his share of the cost.

Provision for reimbursement in accordance with the principle illustrated here would largely remove the element of risk on the part of the tenant. Even though fortuitous circumstances may result in higher than normal net returns soon after application (which would also benefit the owner), there is always the possibility that unforeseen developments may prevent any return over a short period. The plan suggested would operate as a safeguard against such a contingency.

Comparison with "Straight-Line" Depreciation Plan

The vacating tenant's investment is often not adequately protected by plans that provide for "straight-line" depreciation based on the original cost. A plan sometimes suggested stipulates the "writing off" of one-fifth of the original investment each year. Thus, at the end of the first year, the reimbursement would be four-fifths

of the original cost, the second year three-fifths, the third year two-fifths, and if the tenant should leave at the end of the fourth year the payment would be one-fifth of the original investment. No reimbursement is made after the fourth year. This plan has been suggested for use when the tenant has paid for all of the lime applied, so that the reimbursement actually includes payment for what should be considered the owner's share of the investment in the first place. Applying such a plan to the illustration used in this paper, table 5 shows the reimbursement, this plus the tenant's past gross returns, the costs, and the net final returns after reimbursement.

TABLE 5 REIMBURSEMENT, AND RETURNS PER ACRE TO
TENANT UNDER A 4-YEAR PLAN

A With 4 tons of limestone applied per acre

Year	Investment shared				Investment not shared			
	Reimbursement	Total gross receipts	Tenant's cost	Net final returns	Reimbursement	Total gross receipts	Tenant's cost	Net final returns
	1 ¹	2 ²	3 ³	4	5 ¹	6 ²	7 ³	8
1	6 72	7 09	8 74	-1 65	11 20	11 57	14 57	-3 00
2	5 04	6 18	9 09	-2 91	8 40	9 54	15 15	-5 61
3	3 36	5 63	9 45	-3 82	5 60	7 87	15 75	-7 88
4	1 68	5 48	9 83	-4 35	2 80	6 60	16 39	-9 79

B With 2 tons of limestone applied per acre

	1 ¹	2 ²	3 ³	4	5 ¹	6 ²	7 ³	8
1	3 36	3 73	4 37	-0 64	5 60	5 97	7 28	-1 31
2	2 52	3 66	4 64	-0 88	4 20	5 34	7 57	-2 23
3	1 68	3 95	4 72	-0 77	2 80	5 07	7 87	-2 80
4	0 84	4 64	4 91	-0 27	1 40	5 20	8 18	-2 98

¹ Original investment depreciated one-fifth at the end of each year

² Reimbursement, columns 1 or 3, plus tenant's past gross returns, compounded

³ Original investment compounded.

Minus net final returns indicate that the plan sometimes suggested depreciates the investment at a more rapid rate than is compensated for by past gross returns. When 4 tons were applied, benefits continued for 15 years, yet the plan illustrated in table 5 assumes that one-fifth of the investment would be exhausted each year. Because returns from a 2-ton application are assumed to be just as large until they begin to decline, the tenant's position would be less unfavorable under a "straight-line" plan of depreciation, than when the larger investment is made. During the period of rising benefits, the assumed past gross returns relative to cost, are higher in the case of the lighter application. Therefore, with a 2-ton rate of application, the minus net final returns become smaller

before the end of the period, when the investment is shared. When the investment is not shared, the tenant's cost is increased but his share of the returns remains the same. So within the short period covered by table 5, the tenant's losses continue to grow larger for both rates of application when the investment is not shared.

Plans frequently recommended, when applied to this illustration, would not provide for sufficient returns to cover the cost, when the reimbursement is added to the cumulative value of the tenant's share of increased yields. It would be more appropriate to base reimbursements on curves of residual effect that are generally applicable to conditions under which the farm is operated, and that indicate the rapidity and persistence of response that may be generally expected.

Practical Application of the Plan

Obviously, calculations such as are used in this analysis cannot be conducted for individual cases. However, once a curve of residual effect has been established, and the calculations conducted for a type of situation that is representative of conditions in an area, a simple adaptation of the method may be applied quickly in practice. This could be done by expressing the reimbursement for all years as percentages of the original investment. These percentages can then be multiplied by the original investment in order to calculate quickly the reimbursement for the unused portion of limestone for any farm to which a particular curve of residual effect is applicable. Analysis of reliable data that show residual effects under different soil and climatic conditions and different farming systems, is needed in order to provide guides for reimbursement schedules in all areas where the use of limestone is profitable.

Added Capital Value

The productive value of land is derived through discounting the expected future annual returns. The owner's share of the discounted future net returns from the investment represent the added capital value. Table 6 shows the owner's share of the annual gross returns, costs, net returns and added capital value. For the purpose of determining the added capital value, interest on the residual value of the investment is included as a cost (along with depreciation), in obtaining annual net returns. Data for the left, and for

the right portions of this table, correspond with the annual return and the annual depreciation indicated in tables 2 and 3, respectively. The owner's share of two-fifths of the entire increase in yield, is equivalent to two-thirds of the tenant's share as shown in column 2 of those tables. The annual rate of depreciation on the owner's share of the initial investment is derived by taking the differences between the successive annual ratios of future to total returns, in column 6 of tables 2 and 3 (table 6).

TABLE 6.—OWNER'S ANNUAL GROSS RETURNS, COSTS, NET RETURNS AND ADDED CAPITAL VALUE PER ACRE FROM INVESTMENT IN LIMESTONE

Year	4-ton application Owner's investment \$5.60 per acre				2-ton application Owner's investment \$2.80 per acre			
	Owner's share of gross returns ¹	Owner's costs ²	Owner's annual net returns	Added capital value ³	Owner's share of gross returns ¹	Owner's costs ²	Owner's net returns	Added capital value ³
	<i>Dollars</i>	<i>Dollars</i>	<i>Dollars</i>	<i>Dollars</i>	<i>Dollars</i>	<i>Dollars</i>	<i>Dollars</i>	<i>Dollars</i>
1	0.24	0.33	-0.09	6.50	0.24	0.25	-0.01	1.93
2	0.48	0.43	0.05	6.85	0.48	0.38	0.10	2.01
3	0.70	0.41	0.29	7.07	0.70	0.48	0.22	1.98
4	0.92	0.58	0.34	7.07	0.92	0.55	0.37	1.86
5	1.12	0.62	0.50	7.00	1.12	0.60	0.52	1.97
6	1.30	0.66	0.64	6.78	1.30	0.64	0.66	1.09
7	1.46	0.67	0.79	6.41	0.92	0.42	0.50	0.48
8	1.58	0.67	0.91	5.86				
9	1.65	0.63	1.02	5.20				
10	1.65	0.59	1.06	4.40				
11	1.58	0.53	1.05	3.50				
12	1.44	0.44	1.00	2.60				
13	1.22	0.36	0.86	1.71				
14	0.92	0.25	0.57	0.91				
15	0.52	0.13	0.39	0.37				

¹ Two-thirds of the tenant's annual gross returns as shown in column 2 of tables 2 and 3.

² Includes annual depreciation based on differences between successive annual ratios of future to total returns, column 6 of tables 2 and 3, and interest on unexhausted balance of original investment.

³ Value at beginning of each year, of all future net returns discounted at 4 percent.

The owner's future annual net returns from the investment (after depreciation and interest on the unexhausted value of the investment) are discounted at the beginning of each year, to obtain added capital value. Thus, when 4 tons of lime are applied, there are in the first year, 15 annual future net returns to be discounted; 14 in the second year; 13 in the third year, etc. Where 4 tons of

lime are applied, these values are higher in the second to sixth years inclusive, than in the first year, because annual returns are rising at a sufficiently rapid rate to offset the fact that fewer of them are forthcoming. Similarly, when 2 tons are applied, the discounted value of future net returns is higher in the second and third years than in the first year. For each rate of application there is a minus net return in the first year. Also, in the discounting process, each year's returns have a higher value in the year of their occurrence than in the preceding years. Thus, the amount of additional capital value in any year depends on the shape of the curve of residual effect as well as on the total amount and duration of returns. The added capital value is much greater after the 4 ton, than after the 2 ton rate of application because the period of returns is longer. Net returns as used in table 6 do not include the accumulated interest on past returns. Hence, the benefit to the owner in the form of returns received is shown in table 4 rather than in table 6. As with all capital inputs, there is the problem of determining the amount of investment that will yield highest net total returns. This is important to all farmers, whether their interests are limited to current income, or whether they also have an investment in land.

It is true that the added capital value which results from soil improvements such as limestone are not fully recognized. Thus in the land market, the owner may not always be able to "sell" the investment for its proper worth, either in the form of a higher rental share or a sale price that reflects the proper rating of the land in comparison with less productive land in the community. The value of soil improvement investments can be reflected in land prices and rental rates only as buyers and sellers, and owners and tenants recognize their contribution to future income. There is need for research and extension efforts that will make such contribution more widely recognized. Local committees could serve a useful purpose in focusing attention on the proper value of soil-improvement investments. They could suggest appropriate differentials in land values and rental rates for lands of similar physical characteristics and potential yielding capacities, but which vary in actual productivity because of differences in capital investments for soil improvements. Such committees could have only advisory functions and should be composed of qualified farmers. State laws could well make provision for their existence in order to give them appropriate public recognition. In some cases their function could

be carried out within the framework of existing soil conservation districts. The basis for the work of these committees should be the results of experimental work that show the quantity and duration of increases in crop yields that may be expected as a result of specified investments in soil improvement.

Summary

Much of the land that needs additional investment for soil improvement is operated by tenants. It is desirable that the investment be made jointly by the owner and tenant in the same proportion as they share in the returns and that the reimbursement include full credit for the unexhausted value of the tenant's share of the investment at the time he leaves the farm. Progress toward the establishment and maintenance of systems of farming that permit greater income stability will be greatly advanced by general acceptance of the use of lease contracts that will assure the tenant of equitable reimbursement for the unexhausted value of improvements he has made. Local advisory committees having legal status could become an effective part of an educational program to bring about general recognition of the facts relating to the capital value of investments in soil improvements.

NOTES

FARM LABOR DURING WORLD WAR II

PROBABLY no other area of economic activity was given more consideration with respect to the maintenance of its labor supply during World War II than agriculture. It was given special consideration in the drafting of men for the armed services; it secured foreign workers to help in the crop harvests; it had special laws enacted—Federal, as well as State and local—which prevented the recruitment of farm workers for employment in either other agricultural areas or industry.

It is the purpose of this paper, first, to examine the farm employment situation prior to America's entry into the war, second, to summarize the various methods employed to maintain the existing labor force; third, to evaluate the need for the special considerations mentioned in the preceding paragraph; and fourth, to point to possible alternative methods which might have been utilized which would have achieved the same purpose, namely, greater food production.

Extent of Unemployment and Underemployment: 1940

Prior to America's entry into the war, there was a large reservoir of unemployed and underemployed farm workers. A Congressional Committee, after extensive hearings, concluded that in 1940, there was "a reserve of unused or ineffectively used manpower pressing upon the agricultural labor market of at least 5,000,000 workers."¹ This figure included about 2,500,000 workers who were ineffectively used and another 2,500,000 workers who were unemployed.²

Changes in Farm Employment 1940-1943

Between 1940 and 1943 farm workers were lost to war industries and the armed forces. Furthermore, total farm population declined about 3,600,000 during the first few years of the war—1940 to 1943.³ Despite these movements, however, average farm employment in 1943 was only 322,000 less than in 1940, and only 100,000

¹ *Report of the Select Committee to Investigate the Interstate Migration of Destitute Citizens*, 77 "Congress, 1st Session, House Report No. 369, 1941, p. 408.

² *Ibid.*, p. 402-3.

³ U. S. Department of Agriculture, *Agricultural Statistics*, 1947, p. 499.

less than in 1941, the reduction being chiefly among family workers.⁴ The replacement of workers consisted primarily of inexperienced women and children.⁵ Although the efficiency of some of these workers was not equal to that of the workers whom they replaced, one may note that in 1943, the output per worker was about 21 per cent greater than in 1940.⁶

Given the fact that by 1943 there had been no serious depletion of the labor force it might be argued that there was a need for additional workers to meet the requirements of a greater agricultural production, since between 1940 and 1943 agricultural production had risen by about 16 percent.⁷ But this increased production was more than compensated for by the increased productivity of farm workers. The increased productivity reflected better utilization of the then existing farm labor force, increased hours of work per week, as well as increased mechanization.

From January 1, 1940 to January 1, 1943 the number of tractors on farms rose from 1,545,000 to 2,100,000, or more than one-third.⁸ It has been estimated that about 150 man-hours annually are saved by each farm tractor.⁹ One can estimate, therefore, that the added 555,000 tractors contributed over 83,000,000 man-hours of work. Incidentally, this does not take into consideration the additional man-hours contributed to agricultural production as a result of the Government's campaign for greater utilization of existing equipment through pooling and exchange among farmers.

Weighing all the above factors, it is not unreasonable to conclude that whatever losses there were in farm employment during 1940-43 were at least compensated by other factors. Furthermore, one must also recognize the fact that in the year 1943 there was still considerable unemployment and underemployment.

Extent of Unemployment and Underemployment 1943

It was estimated in 1943 that about 15 percent of the farm workers, or roughly 1.5 million, could be spared for employment else-

⁴ United States Department of Agriculture, Bureau of Agricultural Economics, *Farm Labor*, August 12, 1948 (mimeographed) p. 6.

⁵ Louis J. Ducoff, *Wages of Agricultural Labor in the United States*, U. S. Department of Agriculture, Technical Bulletin No. 895, July 1945, p. 23.

⁶ *Ibid.*, p. 16.

⁷ U. S. Department of Agriculture, *Agricultural Statistics*, 1947, p. 532

⁸ *Ibid.*, p. 550.

⁹ Barger, Harold and Landsberg, Hans H., *American Agriculture*, 1899-1980, p. 265.

where.¹⁰ This group was comprised of farm operators and farm workers whose contribution to farm production was negligible. The extent of this underemployment of farm workers in 1943 was confirmed by several studies made by the U. S. Department of Agriculture.

One study revealed that there were from 63,000 to 98,000 available workers in 33 Eastern Kentucky counties on December 1, 1942 who "might properly be considered potentially available for more productive work than their farming operations permit."¹¹ Another survey of the Appalachian Region indicated that in five states, (West Virginia, Virginia, North Carolina, Tennessee, and Kentucky) there were "about 450,000 workers, including approximately 300,000 rural farm males of working age, who could be made available either in agriculture elsewhere, or in industry, for more productive war employment than they now have."¹²

In addition to workers who could have been spared from the farms, these were hundreds of thousands who were idle for protracted periods of time. The Appalachian Region study indicated that an average annual employment of about 821,000 able-bodied adult males could meet the labor requirements for the 1943 farm production goals in the Appalachian area. Yet the estimated annual employment for the region was about 1,300,000, an excess of 475,000. "Seasonably, this surplus of manpower (the report concludes) is estimated to vary from 250,000 man-equivalents in October to somewhat over 600,000 in months like January and February."¹³

This condition, of course, was typical for the entire South. As a rough indication of the extent of poor utilization of the farm labor force in the South one can cite the fact that the Southern states employ about 50 percent of all farm labor but produce for the market only about one-fourth of the farm products, measured in terms of cash receipts from farm marketings.¹⁴

Despite the existence of huge surpluses of farm workers, legisla-

¹⁰ Schickele, Rainier, *Manpower in Agriculture*, Iowa State Agricultural College, 1943, p. 14.

¹¹ United States Department of Agriculture, Bureau of Agricultural Economics, *Manpower for War Work, Eastern Kentucky*, May 1943, p. 1.

¹² United States Department of Agriculture, Bureau of Agricultural Economics, *Manpower and Agricultural Resources in the Appalachian Region*, June 1943, p. 44.

¹³ *Ibid.*, p. 16.

¹⁴ U. S. Department of Agriculture, *Agricultural Statistics* 1947, p. 503, 540.

tion was enacted and various social, political, and economic barriers were either maintained or strengthened so as to "freeze" workers in their areas and jobs. These will be examined in turn.

Deferment of Farm Operators and Farm Workers

The Tydings amendment to the Selective Service Act provided for the deferment of every registrant found by a local draft board to be necessary to and regularly engaged in an agricultural occupation or agricultural endeavors essential to the war effort so long as he remained engaged in them and until such time as a satisfactory replacement could be obtained.

The amendment further provided that if any registrant left his occupation or endeavor, the local draft board could reclassify him in a class immediately available for military service unless he secured from his board a statement that it was in the best interest of the war effort for him to leave such occupation or endeavor for other work.

The most significant aspect of the passage of this amendment for the deferment of farm workers was that the policy was adopted by Congress on the basis of information which later proved to be incorrect.

On February 22, 1943, in response to a series of questions asked by Senator Bankhead, the Secretary of Agriculture submitted the results of a survey based on replies of about 2,800 county agricultural agents. The information received from the county agents was influential in securing the passage of the Tydings amendment.¹⁵

According to the Senate report, about 99 percent of the county agents indicated that "farm labor had been appreciably reduced by being absorbed by the military forces or industry." Furthermore, about 73 percent of the agents reported that there had been no replacement of farm workers who had left farms during the preceding two years. These conclusions, it may be noted, are contrary to the information set forth previously.

The county agents also estimated that there were "slightly more counties where the labor loss has been heavier to the military forces

¹⁵ See Report of Senate Military Affairs Committee on Deferment from Military Service of Persons Engaged in Agricultural Occupations, 78th Congress, 1st Session, March 5, 1943. The report of the Committee contains the results of the county agents' survey.

than to industry." This conclusion seemed to indicate that the major loss was due to the draft. Actually, General Hershey, of Selective Service System, estimated that 15 percent of the persons who had left farms had gone into the armed forces. Senator Hayden, of Arizona, estimated that the percentage was about 25 percent, on the basis of information submitted by the Department of Agriculture and the Selective Service System.¹⁶

The survey of the Department of Agriculture showed further that "a large percentage of the individual agents' answers indicated that such labor as had been available to replace labor lost was very largely inexperienced and inefficient." The increased productivity of workers during the period (discussed above) contradicts this conclusion. About 71 percent of the county agents "indicated that there would be a reduction in the acreage in cultivation in 1943." This prediction was obviously wrong since the acreages of 52 crops planted or grown in 1943 were higher in 1943 than in 1942.¹⁷ It is clear that every conclusion and prediction of the county agents was incorrect. Yet it was from such "facts" that the legislation on deferment of farm workers was enacted.

In order to determine whether or not a farm worker or farm operator should be deferred a yardstick was adopted to assist the local draft boards. The Department of Agriculture and the War Manpower Commission adopted a war-units plan. A list of essential and non-essential products was drawn up (the non-essential products included a handful of small and unimportant crops). War units for the production of essential products were based chiefly on the amount of labor required. At first it was decided that a worker would have to contribute 16 war-units to be considered for deferment. Later, this rule was relaxed to 8 war-units, with the local boards still having considerable discretion.

The effects of the Tydings amendment and the Selective Service procedures adopted were threefold: first, they "froze" workers in their jobs without any consideration being given as to their actual necessity; secondly, they provided a haven for draft-dodgers; and thirdly, they placed on industry the entire burden of contributing manpower to the armed services.

¹⁶ Hearings Before a Subcommittee on the Committee on Appropriation, United States Senate, 78th Congress, First Session, on *Investigation of Manpower*, Part I, p 216.

¹⁷ U. S. Department of Agriculture, *Agricultural Statistics 1947*, p 514.

A report of the Iowa State Agricultural College on "Manpower in Agriculture" pointed out that "there are relatively few farms with draftable men where the output per worker falls below 8 units." Furthermore, the report states that "on the better and more highly mechanized farms more workers are kept on farms than are really needed, because there a worker can readily produce 25 or 30 war units instead of 8."¹⁸

The Selective Service System estimated that by December 31, 1943, about 3,032,000 men in agriculture would be deferred under the Tydings amendment.¹⁹ As of July 1, 1943, nearly 1,500,000 men had already been deferred on the basis of the Tydings amendment, of whom substantially more than a third were in the South.²⁰

Selective Service regulations also provided for the deferment of workers who shifted into agriculture, thereby providing a haven for draft-dodgers. According to scattered reports, such a movement back to the farms did take place. A survey conducted by the Bureau of Agricultural Economics indicated that "from January to April (1943), approximately 110,000 men shifted to farm work from other occupations, in excess of the number who otherwise would have made such a shift."²¹ The War Manpower Commission reported that "the industries chiefly affected in this transfer and the seasonal movement back to the farm, were aircraft, shipbuilding, ordnance, non-ferrous metal mining, lumber, and logging. The effect of the shift to agricultural activities on the staffing of war plants varied throughout the country. Those areas which had tight or critical labor supply situations before the exodus of workers to farms were more seriously affected than those areas which had experienced only minor manpower difficulties prior to January."²²

The California Weekly Agricultural Labor Market Report of April 6, 1942 stated that "within the last month about 1,000 inquiries have been received by USES offices from industrial workers, and from army personnel over 38, who are willing to return to the farm, less than a third of them have inquired expressly for dairy farm work."

¹⁸ P. 10.

¹⁹ Hearings Before A Subcommittee of the Committee on Appropriations, United States Senate, 78th Congress, First Session, on *Investigation of Manpower*, Part 1, p. 104.

²⁰ Figures submitted by the Selective Service System.

²¹ U. S. Department of Agriculture, B.A.E., *Shifts of Males of Military Age to Agricultural Work*, July 5, 1943

²² War Manpower Commission, *The Labor Market*, June 1943, p. 14.

In the South thousands of Negro farm workers were drawn into war construction work after the outbreak of war. When this work was completed, according to reports of the War Manpower Commission, many of these workers returned to the farms in order to secure draft deferment, despite the large number of unfilled orders for men in war industries.

Under the regulations, local draft boards prepared lists of persons who were in the IV-F classification or who were 38 years of age or over, who had previous farm experience and who were employed in non-deferrable occupations and non-essential activities. Form letters were prepared and transmitted to such persons explaining the possibilities for deferment as agricultural workers and pointing out that failure to get in touch with a local war board may result in induction into the armed forces, regardless of age or disability. There were a few instances where letters were mailed to persons employed in a zinc mine in Virginia, a U. S. arsenal in South Carolina, and in the petroleum industry.²³

The Tydings amendment also placed a heavy burden on industry to supply the armed forces with manpower. Prior to the enactment of the amendment, farm employment represented about 25 percent of total employment. Yet, only about 13.7 percent of the members of the armed forces came from agriculture. In other words, agriculture had contributed only one-half of its normal share to the armed forces. Despite this lenient policy, the Tydings amendment was enacted, virtually stopping this source of recruitment. It meant that workers engaged in non-essential farm work were deferred while workers in war industries were drafted.

It is significant that as of July 1, 1944, agriculture with its surplus of manpower had 17 percent of the employed civilians deferred for occupational reasons, while industry had about 9 percent deferred for similar reasons.²⁴

Farm Labor Act of 1943 (Public Law No. 45)²⁵

A nation at war should consider its manpower as being in one national reservoir from which can be drawn workers for agriculture, industry, and the armed forces. Yet the Farm Labor Act of 1943

²³ The War Food Administrator on June 3, 1943 wrote a memorandum to State War Board Chairmen criticizing this activity.

²⁴ Walter W. Wilcox, *The Wartime Use of Manpower on Farms*, this JOURNAL, August 1946, Vol. XXVIII, No. 3, p. 728.

²⁵ Public Law 45, 78th Congress, First Session.

was directed toward keeping local labor supplies "frozen" and created more than 3,000 separate reservoirs of labor. The Pace amendment to this law provided that:

"No part of the funds . . . appropriated should be expended for the transportation of any worker from the county where he resides or is working to a place of employment outside of such county without the prior consent in writing of the county extension agent of such county, if such worker has resided in such county for a period of one year or more immediately prior thereto and has been engaged in agricultural labor as his principal occupation during such period."

This provision violated a fixed principle of efficient labor utilization, namely, that employment can only be decasualized by setting up a single labor reservoir.

Public Law #45, particularly the provision mentioned above, was also enacted as a result of misinformation concerning the farm labor situation. This misinformation was similar to that reported in the county agents' survey. For example, there was considerable discussion—in the newspapers and other places—about farm labor *losses* without any explanation of the fact that there had been *replacements*. In addition, there was talk about a "need" for 3.5 million farm workers. Many believed this to mean a "shortage" of 3.5 million workers. Actually, this "need" merely represented the total number of farm workers who are normally mobilized each year to meet the harvest needs at the seasonal peaks. The experience in 1943 revealed that this mobilization took place.

The provision requiring the approval of the county agent before a worker can be transported into other areas by the Federal Government meant that very few, if any, workers were given such permission. There were reports that county agents feared the loss of their jobs if they certified the existence of a farm labor surplus. A memorandum of the Extension Service stated that "states and counties are loath to certify areas of recruitment." As a result of the "freezing" policy the nation turned to foreign workers for new sources of labor. This simply meant that American workers were idle and underemployed while foreign workers received employment.

Thus, the large reservoir of surplus farm labor in the South was dried up with the passage of this law. A global war, in effect, was being fought on a county basis.

Certain conclusions can be drawn from the operation of the Pace amendment and the use of foreign workers. First, there was a

tendency to bring foreign labor into the United States without any knowledge as to where it would be placed. One net effect was that foreign workers were idle for long periods of time. For example, over 1,000 Jamaicans were brought into Michigan and then forced to seek work outside of agriculture. Secondly, although the importation of foreign workers supposedly took place only after all sources of domestic labor were tapped, some county agricultural agents found it easier to order foreign workers than to put on an intensive recruiting campaign for domestic workers.

*State Emigrant Agent Laws*²⁶

One of the most serious barriers to movement of workers across state lines is the Emigrant Agent Law. Such a law was in existence in twelve states in 1942. Eleven of these states are located within the South. The other state is Pennsylvania. These laws were presumably enacted in order to regulate the recruitment of labor for use outside the state. But, with the exception of Pennsylvania, they were obviously intended to prevent or to discourage the movement of labor outside the state. The chief device employed was the excessive license fee, with punishment for violation under the criminal code. In Pennsylvania, the law specifically states conditions under which emigrant agents may operate, and there is only a nominal fee attached. A tabulation of these acts, showing state, date of enactment, license fee, and other information, is shown below:

State	Date of Enactment	License Fees (annual)	Remarks
Alabama	1923	\$5,000 Up to \$2,500 may be levied by counties in addition	Violation a misdemeanor
Florida	1927	\$2,000	Violation punished by maximum of 1 year prison or \$5,000 fine
Georgia	1933	\$1,000 for each	\$1,000 bond
Louisiana	1938	\$500	\$5,000 bond. Must give commissioner of labor data on place to be taken, for what purpose, duration, whether transportation provided, etc.

²⁶ For an excellent discussion of this problem see Roback, Herbert, *Legal Barriers to Interstate Migration*, Cornell Law Quarterly, Volume 28, Nos. 3, 4.

State	Date of Enactment	License Fees (annual)	Remarks
Mississippi	1930	\$500 for each county	—
North Carolina	1935	\$500 for each county; \$100 to \$500 add. in towns and cities, counties and cities may levy equal amounts	Violation a misdemeanor
Pennsylvania	1935	(nominal)	Same as Louisiana
South Carolina	1932	\$500 for each county	Violation a misdemeanor
Tennessee	1923	\$300	—
Texas	1936	\$1,000 (minimum)	Violation a misdemeanor
Virginia	1930	\$500 plus \$5,600 for each county	Violation a misdemeanor
West Virginia	1931	\$5,000	—

In view of the large fees it is clear that very few licenses would be taken out. With the apparent changed farm labor situation a campaign of strict enforcement of the laws was begun during the early war years.

Effect of the "Freezing" of Farm Workers

The seriousness of the effects of the Tydings amendment, the Farm Labor Act of 1943, and the state emigrant laws was succinctly set forth in a report of a Government agency in mid-1943, when it stated:

"Providing adequate labor for the proposed 1944 and 1945 production program depends first of all on *increasing the mobility of our agricultural workers*. Instead of "freezing" them in their present locations, every effort should be made to insure their rapid, orderly and planful movement from one task and one area of peak demand to another. It is directly contrary to the interests of the war that workers be frozen on farms that are too poor or too small, or which can produce only those crops we have little need for. The prevailing practice of requiring the county agent to approve the transfer of any farm worker out of the county merely assures the continuance of the present poor distribution and use of farm labor, and in fact helps to wipe out the valuable army of migratory farm workers whom we have had in the past. Even worse is the practice, now observed officially by Louisiana, Arkansas, Mississippi, and Missouri, and unofficially by

other states, of prohibiting the recruitment of farm labor for out-of-state use. Unless both federal and state restrictions on the controlled movement of farm labor are removed, any food program that involves either a substantial increase in total output, or a significant shift in emphasis from one crop to another, is impossible without a considerable increase in the total number of farm workers. When the desired results can be achieved by better use of the existing farm labor force, any such increase is indefensible and directly contrary to the interests of the war effort."²⁷

Basic Problems of Farm Labor

Probably the two principal factors which underlay the farm labor problem in the early war years were a maldistribution of the farm labor force and a faulty and unbalanced farm wage structure. The extent of the maldistribution of the farm labor force has already been described above

An examination of the farm wage structure in 1941-1942 indicates the following:

First, there was extreme variation in farm wage rates between the states and regions of the United States. Such variation is symptomatic of the disorganization of the farm labor market. As of October 1, 1942, for example, the daily farm wage rates (without board) were as follows:²⁸

United States	\$2.76
New England	4.06
Middle Atlantic	3.88
East North Central	3.67
West North Central	4.33
North Atlantic	1.82
East South Central	1.75
West South Central	2.30
Mountain	4.34
Pacific	5.60

With wage rates at less than half of other regions, it is easily understood why the Southern states in particular were interested in "freezing" their workers.

Second, there was a great disparity between the wages of farm

²⁷ *Fundamentals of a Wartime Food Program*, Report to the Food Advisory Committee by the Sub-Committee on U. S. Food Allocation Policy, July 1943, p. 29-30.

²⁸ U. S. Department of Agriculture, Bureau of Agricultural Economics, *Farm Labor*, October 19, 1942.

workers and the wages of common labor in industry. The effect of such disparity was to accelerate a movement from "farm to factory." This was the serious problem, not the drafting of farm workers. Only special deferment considerations would have stopped this movement. As of July 1941 the actual wage rates for both groups of workers were as follows.²⁹

	Daily Farm Wage Rates (without Board)	Hourly Entrance Rates for Common Labor
United States	\$1 98	\$.564
New England	3 22	.571
Middle Atlantic	2 93	.622
East North Central	2 79	.629
West North Central	2 69	.589
South Atlantic	1.40	.424
East South Central	1.16	.429
West South Central	1.55	.398
Mountain	2 82	.573
Pacific	3.83	.689

It is of interest to note that common labor wage rates are not only higher than farm wage rates but also vary less than farm wage rates.

Conclusion

The description of the problem automatically suggests the solution, namely, increased mobility of farm workers. This would have required, first, the elimination of all legal and institutional barriers to movements of farm workers; second, the provision of adequate housing facilities for workers to accompany a large transportation program. The effect of such a program, accompanied by higher farm wage rates would not only have permitted a better utilization of the existing labor force but would have been a tremendous impetus in the improvement of the notoriously low living standards of farm workers.

Finally, one should note the extent to which national and state policies can be established on the basis of propaganda and incorrect information rather than on facts.

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²⁹ U S Department of Agriculture, Bureau of Agricultural Economics, *Farm Labor*, July 11, 1941 and Department of Labor, Bureau of Labor Statistics, *Monthly Labor Review*, January 1942, p. 154.

FARMERS' ASSETS OUTSIDE THEIR BUSINESS*

THE amount and character of the assets of farm people in addition to their operated farms are of considerable importance in appraising the financial position of agriculture. Such assets are closely related to the problem of the financial stability and security of the individual family, as well as to the broader question of the financial relationship of agriculture to the rest of the economy. Farm management studies have supplied considerable data on the strictly farm assets, but the other assets of the family usually have been ignored or lumped together without analysis. This paper is a report on a study directed at this essentially blank spot in the financial structure of agriculture.

The Data

A broad survey of the financial position and practices of Pennsylvania farmers was conducted during the summer of 1947. An effort was made to obtain a true cross section of farmers in the state by distributing the 525 records in 158 area segments in 14 counties. As would be expected, refusals were comparatively high, since the survey was concerned with what are ordinarily considered personal financial matters. Records were not obtained from 23 percent of the farmers in the area segments, although "not at home" and "honestly too busy" accounted for 40 percent of the failures to obtain a record.

In view of the number of refusals, it was encouraging that the estimated average size of farm and average age of the operator were 104 acres and 48 years for those from which a record was not obtained, compared with 135 acres and 48 years for the cooperators. Two other points should be noted regarding the information used in the following analysis: (1) the data are limited to the 399 commercial farmers in the sample by eliminating those who had less than 175 productive man work units and those who worked off the farm 5 months or more during the year and (2) the data are limited to the non-farm asset phase of the survey, which also included detailed information on credit and insurance.

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Ordinarily there is no question as to whether a particular asset should be considered an integral part of the operating unit including the farm home or as being outside the business. In some cases, however, the proper classification was not apparent and a few arbitrary decisions were necessary. For example, none of the cash on hand, in the checking account, or of the accounts receivable was considered as being an outside asset. On the other hand, all stock in farm cooperatives was included among outside investments or assets.

The General Picture

Assets held by 399 commercial farmers in Pennsylvania outside their operating units accounted for 13.6 percent of their total net

TABLE 1. TWO DISTRIBUTIONS OF FARMERS ACCORDING TO AMOUNT OF THEIR ASSETS OUTSIDE THE OPERATED FARM, 399 COMMERCIAL FARMS, PENNSYLVANIA, JUNE, 1947

Amount of outside assets	Number of farmers	Percent of farmers	Percent outside assets are of total net worth	Number of farmers	Percent of farmers
None	46	11.5	None	46	11.5
\$ 1-\$ 499	128	32.1	1- 4.9	154	38.6
500- 1,499	88	22.0	5- 9.9	61	15.3
1,500- 2,999	47	11.8	10-14.9	43	10.8
3,000- 5,999	28	7.0	15-19.9	24	6.0
6,000- 11,999	38	9.6	20-29.9	33	8.3
12,000 and over	24	6.0	30 and over	38	9.5
Total	399	100.0	Total	399	100.0

worth on June 30, 1947. Almost 9 out of every 10 farmers owned some assets outside their business, although in 44 percent of these cases such outside assets accounted for less than 5 percent of their total net worth (table 1). However, there were 71 cases, or about 18 percent of the total number of farmers, in which non-operated farm assets equaled 20 percent or more of their total net worth.

The types of assets owned by Pennsylvania farmers outside their business are revealed in table 2. The importance of the various types depends on whether judgment is based on the number of dollars or the number of farmers involved. For example, in terms of total value farm real estate was the most important type of asset owned by farmers in addition to their operated farm, comprising

17.3 percent of the total; however, only 8 percent of the farmers owned other farm real estate. On the other hand, 47 percent of them owned government bonds and 60 percent owned reserves in the form of life insurance. Loans to other farmers in the form of mortgages or notes was not an important outlet for farmers' surplus funds, accounting for less than 5 percent of the total.

TABLE 2. KIND AND IMPORTANCE OF ASSETS OWNED BY 399 COMMERCIAL FARMERS OUTSIDE THEIR OPERATED FARMS, PENNSYLVANIA, JUNE, 1947

Kind of asset	Total value of assets	Percent of total value	Percent of farmers owning each asset	Average value for farmers reporting
Other farm real estate	\$208,839	17.3	8	\$6,162
Government bonds	191,039	16.2	47	1,033
Savings accounts*	178,452	15.1	21	2,099
Life insurance—Operator**	176,966	15.1	60	747
Other real estate	163,618	13.9	11	3,686
Other stock	129,328	11.0	8	4,171
Mortgage loans to farmers	80,725	2.7	3	2,793
Life insurance—Other**	27,242	2.3	24	290
Notes to farmers	22,037	1.9	4	1,469
Other loans	21,386	1.9	3	1,782
Cooperative stock	11,474	1.0	25	114
Other bonds	9,580	0.8	1	1,597
Other	10,068	0.8	1	2,517

* Includes Savings and Loan and Building and Loan Associations.

** Cash reserve value of present policies.

As would be expected, in buying real estate there was a strong tendency to stay close to the home farm; approximately one half of the properties were within five miles. Houses and lots were the dominant types of other real estate, accounting for 50 percent of the total properties. A wide variety of other types comprised the remainder.

Outside of bank stocks, which accounted for one fourth of the reported common stock holdings, variety was the rule in selecting this type of investment. One half of the holdings were represented by stocks listed on the major exchanges, but only one issue was reported as often as two times. About one fourth of the total amount of common stock was represented by the holdings of one farmer who had inherited a substantial sum which he had invested in stocks. However, this was the only instance of large security holdings by one individual.

*Some Factors Related to the Kind and Amount of
Outside Assets*

One of the important factors affecting the kind of assets in which farmers invest funds outside their operated farms appears to be the total dollar amount of such assets that they own (table 3). Those farmers with a relatively small amount of outside assets (less than \$500) had over half of their total in the cash value of their life insurance, with government bonds second in importance. In sharp contrast with this was the group with large outside investments (over \$3,000) where the cash value of life insurance accounted for

TABLE 3. RELATION BETWEEN THE TOTAL AMOUNT OF ASSETS OUTSIDE THE
OPERATED FARM AND THE PERCENTAGE DISTRIBUTION OF THOSE ASSETS
ACCORDING TO KIND, 399 COMMERCIAL FARMS, PENNSYLVANIA,
JUNE, 1947

Value of assets outside the farm	Number of farms	Percent of total assets outside operated farm in					
		Cash value life insurance of operator and family	Other farm real estate	Other real estate	Govern- ment bonds	Savings accounts	Stocks
Less than \$500	174	58	1	4	22	6	1
500- 3,000	185	48	9	6	14	13	8
Over 3,000	90	10	19	16	16	16	11
Total or average	399	17	17	14	16	15	11

only 10 percent of the total. In fact, it was only in this group that other farm and city real estate and common stocks comprised an important part of the total. The apparent diversification in the kind of assets owned, suggested by the relatively uniform percentages in each kind of asset, will be considered later.

Certain characteristics of farmers with varying amounts of assets outside the farm business are shown in table 4. This simple sorting of the data indicates that those farmers with the smallest amount of assets outside the business tended to be younger men with smaller businesses and with much smaller net worths than were the farmers with a large amount of outside assets. Almost one fourth of the farmers with over \$3,000 in outside assets inherited \$5,000 or more, but in all three groups the total amount of inheritance was relatively small when expressed as a percentage of current net worth.¹

¹ These data on inheritance do not cover all types of parental assistance nor have they been adjusted to the current price level which was the basis used in determining net worth

Furthermore, less than 10 percent of the current assets in real estate outside the operated farm were inherited, although almost 40 percent of the assets in stocks were acquired in this way. As would be expected, those farmers with important assets outside the business had smaller indebtedness on the average than did the other groups. Formal education and number of children did not seem to be associated with the amount of outside assets.

TABLE 4. ASSOCIATION OF AMOUNT OF ASSETS OUTSIDE THE OPERATED FARM WITH CERTAIN CHARACTERISTICS OF THE OPERATOR AND HIS FARM, 399 COMMERCIAL FARMS, PENNSYLVANIA, JUNE, 1947

Item	Amount of assets outside operated farm			All farms
	Less \$500	\$500-\$3,000	Over \$3,000	
Number of farmers	174	135	90	399
Median assets outside farm	133	1,156	9,073	612
Median total net worth	9,302	17,117	35,190	15,742
Average size farm (PMWU)	398	430	521	436
Percent inheriting \$5,000*	6	7	24	10
Inheritance as percent of net worth	5	6	8	7
Average indebtedness	1,599	1,201	987	1,326
Percent owing \$100 or more	58	44	23	44
Percent owners and part owners	73	82	90	80
Average age of operator	44	48	52	47
Average school grade completed	8 7	8 9	9.5	9.0
Average number of children	3 1	2 7	3.1	3.0

* Any inheritance by the farmer's wife was included in determining the total amount of inheritance.

The preceding analysis of the association of certain factors with the amount of assets outside the farm was refined somewhat by dividing the farmers with more than \$24,000 net worth into two sub-groups on the basis of whether more or less than 8 percent of their total net worth was represented by assets outside the business. The most interesting feature of this particular analysis was the fact that while it was intended to deal with a homogeneous net worth group, sub-sorting on the basis of the percentage of total assets outside the business resulted in an average net worth of \$34,400 for the 51 farms with less than 8 percent of their total net worth in outside assets, compared with an average net worth of \$41,200 for the 66 farms with a larger proportion of outside assets. In other words, the analysis keeps pointing to the logical and dominating importance of total net worth in explaining differences in the

amount of assets outside the business with other factors playing a secondary role. This relationship is shown more clearly in table 5.

This table suggests that the relative importance of assets outside the business to total net worth may be divided roughly into three levels or groups. In the first group comprising those farmers with less than \$12,000 net worth, the amount of assets outside the business was relatively small. In the second group, with net worths

TABLE 5. RELATION OF TOTAL NET WORTH TO THE AMOUNT OF ASSETS OUTSIDE THE BUSINESS, SIZE OF BUSINESS, AND AGE OF OPERATOR, 399 COMMERCIAL FARMS, PENNSYLVANIA, JUNE, 1947

Total net worth	Number of farms	Average size (PMWU)	Average age of operator	Average net worth	Average assets outside business	Non-business assets as percent of total net worth
Less than \$ 5,999	48	314	36 8	\$3,678	\$317	8 6
\$ 6,000- 11,999	101	352	43 8	8,956	510	5 7
12,000- 17,999	75	347	47 6	14,703	1,855	12 6
18,000- 23,999	58	439	49 4	20,933	2,146	10 2
24,000- 35,999	53	577	51 2	28,717	3,298	11 5
36,000- 47,999	28	588	52 2	41,305	6,551	15 9
48,000 and over	36	684	53 0	70,402	13,518	19 2
Total or average	399	486	47 1	\$21,581	\$2,945	13 6

of between \$12,000 and \$36,000, the proportion was somewhat larger but did not change appreciably within this range. In the third group beyond \$36,000 there was a tendency for the proportion of non-business assets to increase. Up to this group, size of business had tended to increase in line with total net worth, but at this level expansion of the operating unit did not keep pace with the increase in total net worth.

An Appraisal of the Assets Outside the Operated Farm

One of the first tests ordinarily applied to a financial program is that of diversification among several types of assets. The fact that the operated farm ordinarily comprises such a large part of total net worth and that farm income is highly variable would seem to make it particularly important for farm people to consider diversification in investing funds outside their business.

In this connection the following facts on diversification by the 90 farmers with over \$3,000 in assets outside their business are significant. In 78 percent of the cases, over one half of the individual's total outside assets was accounted for by his largest investment.

In 40 percent of the cases over three fourths of the total was accounted for by the largest investment. The tendency toward concentration was greatest when the largest investment was in real estate, and least when the largest amount was in government bonds, savings accounts or loans to other farmers.

TABLE 6. RELATIVE IMPORTANCE OF REAL ESTATE AND STOCKS COMBINED IN THE ASSETS OWNED BY COMMERCIAL FARMERS IN PENNSYLVANIA, OUTSIDE THEIR OPERATED FARM, JUNE, 1947

Amount of outside assets	Average percent in real estate and stocks	Percent of farmers with over 50 and 75 percent of their total outside assets in real estate and stocks	
		Over 50 percent	Over 75 percent
Less than \$ 500	5 4	2 3	1 7
\$ 500- 3,000	17 2	14.8	10 4
3,000- 7,000	30 0	29 4	17 6
Over \$7,000	48 5	46.4	30 4

An alternative and perhaps more significant approach would be to consider the diversification problem from the standpoint of the farmer's total assets including his farm. Viewed in this light a concentration of funds outside the business in government bonds could hardly be criticized. Since the value of the operated farm is geared closely to the general price level, the individual's assets outside the business were rated on their general sensitiveness to fluctuations in the economy. Non-operated farm real estate, other real estate, and common stocks were grouped together as being sensitive to general fluctuations and hence not ordinarily a good means of spreading the risks inherent in the value of the operated farm. The relative importance of these sensitive assets is indicated in table 6.

These data indicate clearly that many farmers who had a significant amount of assets outside the business had their assets in investments with an unstable monetary value. Thus, even though the value of such non-business assets might be substantial, they would often fail to contribute effectively to the economic stability of the family. The quality of the sensitive assets would affect the degree of risk in individual cases but it is questionable whether the average quality would be sufficiently high to materially alter the basic instability of this type of asset during a general deflationary period.

In the case of sensitive assets, timing and selection are of great importance if the capital value is to be maintained or increased. The degree of success of the farm operators in this respect can hardly be judged at this point. A tabulation of the time of purchasing sensitive assets showed that 34 percent of the total number of such assets and 40 percent of total current value were acquired after 1944. In 57 percent of these cases the value in June 1947 exceeded the cost. The analysis by type of asset did not reveal any major differences among them with respect to timing or apparent success as judged by current value in relation to cost. In other words, the continuing inflation had kept actual losses to a minimum up to the time of the survey, with the final success of these commitments depending on the future course of prices and disposition of the property.

Investment Intentions

Up to this point all information has pertained to the assets owned at the time of the survey. The cooperating farmers also were asked the question, "If you were going to invest additional money outside the farm business, where would you invest it?" Although the persons surveyed did not think of outside investments in as broad terms as those used in this paper, the answers to this question are enlightening. Government bonds were the first choice of 32 percent of the 284 farmers who gave definite answers. Other farm real estate was the first choice of 22 percent, followed closely by non-farm real estate with 19 percent. In other words, 41 percent of the farmers would select real estate for any additional investment outside their business, even though real estate now constitutes their principal asset. Stocks and bonds were chosen by 8 percent of those farmers answering the question. The reasons given for their investment choices are shown in table 7.

It is significant that many farmers appeared to appreciate the difference in the safety of their principal when they choose real estate and securities instead of government bonds for their outside investments. As would be expected, familiarity with farm real estate was one of the important reasons for selecting it as the medium for further investments outside the business. Somewhat surprising was the relative importance of "high return" as a reason for selecting other real estate and securities, or perhaps it is another example of "greener pastures."

Analysis of the answers on the basis of the present amount of assets outside the business and on the basis of the nature of the largest investment at present indicated that these two factors were not particularly important in indicating investment choice. One factor which seemed to be associated to a significant extent with the present amount of outside assets was the number who did not answer the question. The "no choice" answer occurred in 36 percent of the cases where the total outside assets were less than \$500,

TABLE 7. PERCENTAGE DISTRIBUTION OF THE MAJOR REASONS FOR SELECTING THE INDICATED MEDIUM FOR INVESTING FUNDS OUTSIDE THE FARM BUSINESS, COMMERCIAL FARMERS, PENNSYLVANIA, JUNE, 1947

Investment choice	Number of farmers	Percent giving following reasons:		
		Security	High return	Familiarity
Government bonds	91	95	5	—
Farm real estate	63	43	6	24
Other real estate	54	48	22	2
Securities	24	22	48	—

while only 16 percent of those with over \$3,000 in outside assets failed to indicate their investment choice.

The nature of farmers' present investments was related in some cases to their choice for further investments outside the business. For example, in those cases where government bonds comprised the largest item in their present outside assets, government bonds were also the most common choice for further investments. However, government bonds were the choice for slightly less than one half of those now emphasizing government bonds in their outside assets.

There was also a tendency for farmers whose largest investment was real estate, including both farm and non-farm, to indicate some type of real estate as their investment choice. However, almost one half of those with real estate as the dominant asset indicated some other choice for investing additional funds.

Summary and Implications

This survey conducted in the summer of 1947 reveals that Pennsylvania farmers had important assets outside their operated farms. In almost 60 percent of the cases such assets exceeded \$500 and in 15 percent they exceeded \$6,000. On the basis of value, other

farm real estate was the most important type of asset, followed closely by government bonds, savings accounts, cash reserves in life insurance, and other real estate. In those cases where the total amount of outside assets was comparatively low, government bonds and cash reserves in life insurance were important, while real estate and securities were more important in the case of those farmers with large amounts of outside assets.

The actual amount of the assets outside the business appeared to depend more on the total net worth of the operator than on any other factor. After total net worth reached a high level, size of business did not increase proportionately so that a larger percentage of the total net worth was in assets outside the business. Inheritance was not a major factor in explaining the amount of assets outside the business except in a few cases.

The greatest weakness in this picture of financial assets outside the operated business was the lack of diversification. Not only did one type of asset commonly represent a large part of the total, but more importantly, a considerable amount was represented by assets which would tend to fluctuate in value in line with the value of the farm business. Thus, in many cases where the outside assets were large they would fail to add effectively to the financial stability of the family during a deflationary period. This inclination to select sensitive as contrasted with protective assets was also revealed by the operators' answers to the hypothetical question of where they would invest additional funds outside the business. Almost one half of those designating a choice indicated a preference for real estate and securities.

By revealing the relative importance of farmers' assets outside their business, together with some of the problems associated with such investments, this study focuses attention on the broader problem of the alternative uses of farmers' savings.

In the writer's opinion this is a problem area of greater importance than is indicated by the amount of resources being devoted to it at either the research or extension level. While it is unfair to say that the problem has been ignored, particularly in Extension, it is true that the concept of the many available alternatives has seldom been adequately developed or presented. In other words, our approach has tended to be piecemeal rather than comprehensive, in a manner somewhat reminiscent of our earliest educational

efforts to improve farm efficiency by emphasizing individual enterprises without regard as to how such enterprises should be integrated into a balanced farming system.

There is real need for research and extension support of a comprehensive program in financial planning analogous to the balanced farming programs now under way in a number of states.² Such efforts should enhance the family's satisfaction from their expenditures and increase their economic security through a more balanced investment program. It should also have some moderating effect on the demand for land in prosperous times by developing an understanding of and appreciation for alternative uses of disposable farm income.

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DISCUSSION: "A NEW SYSTEM OF FARM ACCOUNTING"

IN THE recent issue of the JOURNAL OF FARM ECONOMICS (August, 1948) there appeared an article by A. L. Jolly worthy of the attention of farm accountants and managers. Mr. Jolly in "A New System of Farm Accounting" outlined a system of double entry accounting on statistical cards that he has devised, and that he asserts is a considerable improvement over the conventional "double-entry" system.

The subject is worthy of discussion. I trust that the recent article and the following comments may bring forth additional treatises in the future.

1. In the first place, everyone should recognize that farm accounting is not a goal in itself—it is a means of attaining a number of worthy objectives. Any attempts to lessen and lighten the work involved are worthwhile, and Mr. Jolly is to be commended for his endeavors.

2. Mr. Jolly is right in asserting that there is largely a tendency to stress only an analysis of the farm business as the objective for

² See Federal Extension Service Circular 422, January, 1945, "Farm and Home Financial Planning," by Z. L. Galloway and Mary A. Rokahr for a good discussion of the considerations and procedures for over-all financial planning.

farm bookkeeping. Recently the objective of facilitating the preparation of income tax reports has been emphasized. But other objectives that call for accounting of "all" the family affairs are insufficiently stressed.

3. Mr. Jolly seems to give the impression that only double-entry or "orthodox" accounting will suffice for "all accounting." However, there are several so-called single-entry farm account books prepared by University farm management specialists that are designed to enable the farm family to account for all of its affairs.

4. Mr. Jolly indicates that double-entry bookkeeping facilitates checking back to cash and credit purchases and sales. This is certainly one of the advantages of double-entry bookkeeping. But there are a number of advantages and disadvantages of both systems. Experiences have shown that both systems have their place and proper adaptations.

5. The proposed system outlined by Mr. Jolly is designed only for the double-entry accounting. Now it is possible to develop a similar system for single-entry accounting. Supplemental cards or sheets are used by farmers for hanging near roadside markets, feed and fertilizer storage spaces, milking parlors, etc. Many farmers obtain itemized statements from stores. Carbon copies of checks could be arranged for, as Mr. Jolly suggests. Some banks aid farmers in the preparation of income tax reports by sorting their returned checks by enterprises and showing sub-totals on their bank statements.

In fact, for the single-entry system no provision would need to be made for sorting and resorting the cards. Carbon copies could be made of cards carrying the entries of inside transfers of value within the farm business. All cards could be placed in separate compartments in manila folders or filing cases, each compartment designed for separate enterprises or items for which sub-totals are desired in financial, business analysis, or income tax statements.

6. Mr. Jolly stresses the savings in time and work that his card system would permit as compared with the conventional double-entry system. It is not clear as to what he means by the latter. If he is referring to the old-style two-column Journal with all items posted to a Ledger, there is very little question concerning his assertions. But modern methods of double-entry accounting have themselves provided for decided savings in time and work. Among other things these methods include multiple-column Journals and

numerous supplemental forms or "cards" kept close to the sources of data or various farm operations for the accumulation of weekly, monthly or quarterly totals.

7. Mr. Jolly indicated that the cost of equipment necessary for using his card system in farm accounting is negligible—less than three dollars. This does not include the cost of the cards, nor of cabinets or other means for filing and storing the vast amount of cards that would accumulate in a few years. Nor does it include the cost of an adding machine, which is a considerable amount.

Farm account books, journals and ledgers can be totaled, if necessary, without the use of adding machines. But it would be rather difficult to dovetail a large number of cards so that they could be totaled by the eye. On account of the space occupied by the perforations and accompanying numbers, the values must be set back from the border considerably, as illustrated in Figure 6 of the Journal article.

8. Even with the use of an adding machine, the turning over of cards slows up the process of additions somewhat.

9. As a rule, proficient farm managers need to scrutinize the situation in connection with each enterprise occasionally if not frequently. With the conventional system multiple columns may be used for such items as cash, bank account, egg sales, milk sales, wages paid, etc. for which there are numerous transactions. The sub-totals may be posted at certain intervals. Entries for purchases, sales, etc. of livestock, tobacco, grain, etc. may be entered in general columns in the Journal and posted individually to the Ledger. Then the manager can readily scrutinize the various accounts in the Ledger at any time, and quickly grasp the situation.

With the proposed card system each scrutiny would call for a re-sorting of the cards, a totaling of the amounts thereon, and spreading them out to observe relations of parts to the whole.

10. One wonders whether Mr. Jolly hasn't over-looked the situations in which a card system could be used to real advantage. On a few large farms the volume of transactions and profits are sufficient to justify the additional investment necessary to use a punch card system, with the use of machines that both sort and produce totals and sub-totals. Some of these farms are adjuncts to other businesses such as canneries, dairy processing plants, etc. which could share part of the costs of the accounting equipment. Others are sufficiently large to warrant the expense solely for the farm business.

It is conceivable that substantial savings of time, work, and clerical expense could be made by the use of the card system with punch cards in these large farm businesses. But for the great majority of our farms there is a possibility that the extra time involved in sorting and re-sorting with needle and clipped cards, and in adding from cards for current observations and determinations of results, would approximately equal any savings involved in making Journal entries and posting to a Ledger. This is especially true in reference to comparing the card system with the use of forms for accumulating routine data close to the locations of operations in conjunction with well planned multiple-column journals.

11. Among other advantages claimed or apparently inferred by Mr. Jolly for his card system as compared with conventional double-entry bookkeeping are the following:

(1) The entering and checking of transactions is facilitated by his card system.

(2) The card clippings enforce decisions, the accumulation of which "results in more precise distinction being made in the classification of transactions"

(3) His system facilitates detection of wastage and unbusiness-like methods, and the encouragement of better control of operations and management procedures.

(4) His system requires less clerical skill.

The inference that these four advantages, as well as others stated above, may be definitely claimed for his card system is undoubtedly subject to challenge. Of course that is a matter of personal opinion, which might be changed with considerable experience in using the system. Although the explanations of principles and the illustrations seemed quite clear, this writer may have misunderstood some parts of Mr. Jolly's article, and, if so, will appreciate having any apparent misinterpretations corrected.

Undoubtedly many farm accountants and farm management specialists would appreciate knowing the opinions and, preferably, experiences of other workers who have used some of these systems of accounting or modifications thereof.

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RESULTS OF TWO SAMPLING METHODS USED IN
FARM MANAGEMENT RESEARCH

A REVIEW of developments in sampling farms as reported in the JOURNAL OF FARM ECONOMICS and in the *Journal of the American Statistical Association* in the last few years indicates that work in this field has been generally concentrated on samples that are larger and spread over wider and more diverse areas than samples more commonly used in research in farm management. Yet principles developed carry very definite implications for small samples for use in farm management studies within limited areas where efficiency and precision are essential to most satisfactory results.

Efficiency per schedule has been shown to vary inversely with size of blocks used as sampling units. Geographic stratification as a means of controlling random sampling variation usually increases precision of a sample, with the smaller strata giving more effective control. Area sampling makes the use of definite sampling rates possible because the number of units in the area to be covered is known. Possibilities for use of aerial photographs for increasing accuracy have been recognized.

Questions on which the writer has been able to find less definite suggestions include the influence of variation in size of blocks included in a sample, as in a method where the number of farms within a block is determined by the number of farm headquarters found within the boundaries of the block. Another question on which little information was found is the suitability of various items and measures used in estimates of reliability of a sample. This question arises from the fact that relative efficiencies of two designs, as indicated by a comparison of variances for samples, vary with the items used for the comparison.

Differences between two small samples drawn from an area in Mississippi give an indication of sampling errors and decreased efficiencies that may be associated with size of block, variation in number of farms per block, and items used for comparison, although the sample having wide variation in number of farms per block was not large enough to permit a separation of the influence of this item from that of size of blocks.

One of the samples used in the comparison was developed through

a procedure that seems to be in accord with suggestions from results of recent developments in sampling, when the objectives of sampling include determining approximate distributions or means for farms in an area. It makes use of the most accurate and complete information available as to number and location of farms in the area studied, and illustrates a means by which most of the advantages of using individual farms as sampling units can be combined with advantages of area sampling. This sample is drawn from aerial photographs in the county office of the Production and Marketing Administration. The other method is one which is in common use in various parts of the country since development of the materials from which the Master Sample of Agriculture was drawn, and which in this area includes blocks or segments with a rather wide variation in numbers of farms.¹

The Two Methods of Sampling

Development of the farm classification and analysis project in the test-demonstration program of Mississippi State College and the Tennessee Valley Authority made it desirable to use the best sampling method available to obtain information on the approximate distribution of farms and characteristics of farms in the different classes or major situations. In this project, analysis of groups of farms found in such a cross-section sample of an area is designed to facilitate location of test-demonstration farms within the different major situations in the area and development of farming systems adapted to resources of these farms. For these reasons, measures for determining distributions and describing characteristics also had to be adapted and developed.

Possibilities for additional farm development on nonfarm land were to be explored. This was an additional encouragement toward use of some form of area sampling.

Area sampling as used to select the Master Sample² was recom-

¹ Acknowledgment is made to Mr. Earl Houseman of the Bureau of Agricultural Economics for constructive criticism of alternative sampling methods considered in developing the method used in drawing the sample for which this comparison is made with one from the material used in drawing the Master Sample of Agriculture, for suggesting statistical procedures suitable for the comparison, and for a most helpful review of the manuscript. Acknowledgment is also made to Mr. Emil H. Jebe of the Institute of Statistics, North Carolina State College, for a very helpful review of the manuscript. The author, of course, assumes all responsibility for statements made.

² "The Master Sample Project and Its Use in Agricultural Economics," by R. J. Jessen, this JOURNAL, Vol. 29, No. 2, May 1947.

mended by our statistical consultants for use in sampling both farms and nonfarm land. The sample referred to in this statement as the "cluster sample" was selected from the Master Sample maps, the sampling units being small blocks or areas called "segments," which have identifiable boundaries and in so far as possible the same number of farms (census definition). The base maps used to develop the Master Sample maps are county highway maps which indicate the location of houses and were published in 1939. The size of the segments ranged from about 4 or 5 indicated houses to about 10 or 12. The topographical features of the area under study, inaccuracy of the highway maps as to location of houses in 1947, and the fact that nearly one-half of the families living out in the country are other than farm operator families made considerable variation in number of farms from segment to segment unavoidable.

The other sample used in the comparison, referred to in this statement as the "farm sample," was drawn from Production and Marketing Administration aerial photographs by using as sampling units or segments individual farms plus the farm's pro rata part of any adjacent nonfarm land, thus giving complete area coverage of farms and non-farm rural lands the same as in the cluster sample.

The method of selecting the farm sample can possibly be set out most simply by comparison with the method used in selecting a sample from Master Sample materials, assuming that the reader has at least a general idea of how such a sample is selected. The same procedure was used for selecting the farm sample as for the cluster sample except for adjustments indicated in the column headings of the following tabulation form, in which the column headings for the farm sample are in parentheses:

1	2	3	4	5	6	(7)
Minor civil division number	Count unit number	Number sampling units— segments in count unit	Cumulative sampling units— segments	Count unit selected	Segment number	
(Flight tier number)	(Photograph number)	(Number farms on photograph)	(Cumulative number farms)	(Photograph selected and farm number drawn)	(Name of farm operator)	

In drawing the farm sample, following systematically through all the photographs as they were made by flights, as columns 1, 2, and 3 were filled and the figures from column 3 cumulated in column 4, a random number between one and 40, the number indicated by

the sampling ratio, was selected. The number drawn marked the first farm selected, the one that served as the beginning point for taking every fortieth farm down through the cumulative totals in column 4.

One column (7) for acres of nonfarm land was added to the tabulation form for use in the farm sample, and the approximate acreage of such land was entered from the photograph for each segment selected and containing nonfarm land. This figure was obtained by measurement of the area included when the boundary lines of each selected farm adjacent to nonfarm rural land³ were extended into the nonfarm land area to the points where they would meet similar extensions from other farms bordering the nonfarm land when all of the nonfarm land was considered to be prorated to adjacent farms on the basis of frontage of the farms on the nonfarm land. Boundary lines of the farm sample segments, with farm lines solid and nonfarm lines dotted, were transferred to county soils maps which showed section lines, roads, streams, and houses the same as on county highway maps.

The Northeastern Highland Area

The general soils and type-of-farming area from which the samples were drawn is commonly referred to as the Northeastern Highland Area. It is in the three Tennessee Valley counties of Mississippi, and is an area of hills and narrow valleys containing a little over one-half million acres, with about four-fifths of the land in farms and less than one-half of the farm land cleared.

Rural resident families in the area, that is, farm families and other families living out in the country, are distributed in the approximate ratio of 7, 3, 2, 1 among farm operator families, other families farming, still other "census farm" families (also meeting the United States Census definition of farm operator families), and other families, respectively.⁴

³ Nonfarm land use for residences and business purposes inside towns and villages was omitted from acreages recorded as nonfarm rural land in both samples, because the areas of special interest in the survey were farm lands and land that might be or become farm woodland, cropland, or pasture.

⁴ Farm operator families are families who are operating and managing their farms independently of other farm operators. About 30 percent of the farm operators in this area have one or more other families farming with them. These "other families farming" are nearly all share renters ($\frac{1}{2}$ and $\frac{1}{4}$ share) and croppers ($\frac{1}{3}$ share). About 75 percent of the farm operators are owners, the remainder being almost entirely share renters, with only an occasional cropper or cash renter among them. Families

Quality and use-suitability of the sandy Upper Coastal Plain soils of the area are closely associated with elevation and topography.

Size of farms in this area is influenced by kind of soils much the same as is land use and size of fields. Farms using mainly the poorer, drier, more rugged soils for crops have less than one-half as many acres of cropland as those using mainly the better soils for crops. They have about the same number of cropland fields and use about two-thirds as much labor as farms on the better soils. The acreage remaining in woodland is about the same per farm in these two soils situations. The distribution of farms within these soils situations by acres of open land (cropland plus open pasture) shows that farms using mostly the poorer, more rugged soils tend to be small and that those on the deeper, more moist soils tend to be relatively large.⁵ Multiple family farms are, as is true for farms on which tractors are used, generally the larger farms with higher proportions of cropland on the better, deeper, more moist soils.

Cotton, corn, and small acreages of hay are the principal crops of

referred to as "still other census farm families" are ones who are really not farming but yet live out in the country and have a garden, chickens, and a cow, or otherwise meet the census definition of producing \$250 worth of farm products or having three acres of land on which some farm products are produced. In the survey for which this report is made a farm includes all land farmed under one operator.

⁵ The comparison is made between farms having one-third or less of their cropland on the deeper, more moist soils and those having two-thirds or more of their cropland on those soils, based on a cross-section survey of the entire area. The division between the two general groups of soils found on farms was made by combining soil types and phases into groups having similar suitable uses and management requirements and which were found in similar geographic positions, arranging these use-management groups in order to fit the land-use pattern of the area, and then determining what appeared to be the most significant point at which a break in the scale could be made for grouping cropland.

The soils-grouping of farms is based on the land-use pattern and the association of sections of the pattern with kind of soils used for cropland which on farms in this area is nearly all of the best open land. The association is a natural one based on the location of soils. The land-use pattern of the area, formed by uses to which farmers tend to put the different kinds of soils, is as follows: Lowest wettest land, permanent woodland, hardwood; next wettest, permanent pasture, slightly better drained soils, hay; still better drained soils but not dry enough for good cotton land, corn; well drained soils including especially the dry sandy hillsides, cotton; steeper and more eroded hillsides and other poor and rugged soils, permanent woodland, pine and mixed pine and hardwood. In terms of use-management groups of soils and even within soil types there is a considerable overlapping of "corn" and "cotton" land. In terms of the association of these groups with elevation and slope, the division between the two general groups used in obtaining the measure of kind of soils used for crops was made at the upper end of the range for soils that are commonly good "corn" land. The measure referred to in this statement as the "soil ratio" was obtained by finding the ratio of the acres of cropland on the lower, deeper, more moist soils to the total acres of cropland.

the area, with relatively larger acreages of corn and hay being grown on the deeper, more moist soils, and relatively larger acreages of cotton on farms having a higher proportion of their cropland on the poorer, drier soils. Lespedeza is the principal hay crop on farms having higher proportions of the deeper, more moist cropland soils, while soybeans provide the smaller amounts of hay grown on the poorer, drier soils

Farms in the most rugged, most severely eroded areas are being abandoned to pine timber production, while further concentration and expansion are the rule in the lower, wetter areas.

Tishomingo County, entirely within the area and making up approximately one-half of it, was used for the test of sampling methods. It is slightly more rugged than parts of the area extending into adjoining counties. The county has been measured, by acres of different soils in the Soil Survey, and photographed, with farm boundaries for both cooperator and non-cooperator farms marked on the photographs by the USDA Production and Marketing Administration. Approximately 30 percent of the total land of the country, 40 percent of the farm land, one-half of all cleared land, and 60 percent of the cropland is on the deeper, more moist soils.⁶

The Cluster Sample Vs the Farm Sample

Sampling ratios of 1:30 for the cluster sample and 1:40 for the farm sample, totalling about six percent for the combined sample, were used in Tishomingo County for the comparison made to determine the sampling method to be used in the remainder of the area and in other similar areas into which the Farm Classification and Analysis studies are to be extended.⁷

Each method yielded 47 farms, with 55 families farming in the cluster sample and 64 families farming in the farm sample. The total number of "census farms" was larger for the farm sample, but the total number of families, including rural residents not even meeting the census definition of farm operators was larger for the cluster sample. The cluster sample was composed of 14 segments

⁶ See footnote 5 for basis and significance of this grouping of soils

⁷ Plans at the beginning of the survey were to continue use of both sampling methods through the entire Northeastern Highland Area. But field observations and preliminary summaries of the two samples in Tishomingo County indicated that further data for a conclusive comparison for this area should not be needed and that a better sample could be obtained by use of only the one better method for the remainder of the area.

varying in number of farms from none to seven and in number of "census farms" from one to eleven. The farm sample was composed of 58 segments. Forty-seven contained one farm each, five contained areas each of which had been a farm in past years but was not farmed in 1947, three contained only farm land operated as parts of other farms, and three contained only "census farms." The acreage of nonfarm land obtained in the cluster sample indicated only about one-half as much nonfarm land as is indicated by other most reliable figures, while the farm sample appeared to be a little too high on nonfarm land.

Testing the two samples by the common practice of comparing variances for such items as size of farm and acres of various crops was somewhat inconclusive. Two examples will illustrate the point. Acreage of cropland per farm was represented in the cluster sample by 27.5 with an estimated σ^2 of 6.4, while the corresponding figures for the farm sample were 37.4 and 13.5. Acreage of hay per farm was represented in the cluster sample by 2.1 with an estimated σ^2 of .29, and in the farm sample by 3.1 with an estimated σ^2 of .14.⁸ The wide differences in means between the two samples suggested that one might be much more accurate than the other, but the variance for acres of cropland was relatively lower in the cluster sample while that for acres of hay was relatively lower in the farm sample.

In the cluster sample, a relatively smaller number of farms, smaller acreages, fewer families farming, lower proportion of the cropland cropped, and a larger acreage of open waste land indicated clearly that the soils on farms in this sample were of a lower quality than those in the farm sample. Comparison of numbers of farms and acres of cropland in each of the samples with Production and Marketing Administration records indicated that figures for farms in the farm sample were much more accurate. Comparisons of acreages and kinds of soils with figures from the

⁸ Pearson's approximation for the variance of a ratio.

$$\frac{1}{n} \frac{\bar{x}^2}{\bar{y}^2} \left[\frac{\sigma_x^2}{\bar{x}^2} + \frac{\sigma_y^2}{\bar{y}^2} - \frac{2r\sigma_x\sigma_y}{\bar{x}\bar{y}} \right]$$

There n = number segments in the sample

x = segment total for acres cropland

y = number farms in segment

r = coefficient of correlation between x and y

All figures presented for σ^2 in this statement have been adjusted for difference in sampling ratios to make them comparable for the samples.

Soils Survey of Tishomingo County and with figures for the entire area from the survey of which these two samples are a part gave the same indication.⁹

Analysis of the data from the entire survey having indicated kind of soils as having a major influence in determining size of farm, crop yields, land use, labor used, and other major items in this area, a comparison of the two samples was made for the proportion of cropland on the deeper, more moist soils.¹⁰

The soil ratio on a percentage basis was represented in the cluster sample by a farm mean of 49 with an estimated σ^2 of 52, indicating a relative efficiency of .27 for this method for sampling kind of soils used as cropland when compared with a farm mean of 56 with an estimated σ^2 of 14 for the farm sample. Soil ratios for total cropland were 53 and 62 for the cluster sample and the farm sample with variances of 833 and 911, respectively, indicating a relative efficiency of 109 for cluster sample segments (3.36 farms per segment) in comparison with farm sample segments (.81 farms per segment). Variances of soil ratios for segments were 60 for the cluster sample (14 segments) and 16 for the farm sample (58 segments).¹¹

⁹ "The Production and Marketing Administration has measured 50,678 acres of cropland in 1482 (about two-thirds) of the segments from which the farm sample was drawn. The cluster sample included 1292 acres as one-thirtieth of the cropland, while the farm sample included 1766 acres as one-fortieth of it.

In the most recent soil survey of Tishomingo County, in 1935, 109,000 acres of cleared land were listed. No distinction was made between farm and nonfarm land, but practically all of the nonfarm land is woodland. Total acreages of cleared farm land as estimated from the cluster sample and the farm sample by multiplying sample totals by 30 and 40, respectively, were 62,000 acres and 104,000 acres for the cluster sample and the farm sample, respectively.

Acres of cropland per farm for the entire survey, including 60 schedules from slightly less rugged parts of the area extending into adjoining counties, was 39.5 acres, only slightly higher than the 37.4 for the farm sample but considerably higher than the 27.5 for the cluster sample."

¹⁰ See footnote 5 for explanation of grouping farms in this area by kind of soils used as cropland and determining the soil ratio for each farm.

¹¹ The variance of $\frac{EX}{EY} \frac{E(p-\bar{p})^2}{n-1} = \frac{Ep^2 - (Ep/n)^2}{n-1}$

Where x =segment total for acres of cropland on the deeper, more moist soils
 y =segment total for acres of cropland
 p =the proportion for each sample segment
 The variance of

$$\frac{x}{y} = \frac{\sigma^2}{n}$$

In non-statistical terms and recognizing opportunity for a considerable range of error in samples containing only 14 and 58 independent observations, this comparison indicates that for sampling the combination of soils used for crops, the most dominating single factor found in a farm management analysis of the data obtained, more than three times as many farm schedules would be required for obtaining an equally good sample by the cluster sample technique as by that used in obtaining the farm sample. On the basis of segments, considering total cropland on farms in each segment without regard to number of farms, only about a 10 percent larger number of segments would be required for the small farm sample segments than for the larger cluster sample segments containing about four times as many farms per segment.

Relative Costs and Efficiency

Relative costs per schedule for enumeration by different sampling methods have been shown to vary with length of schedule, cost of transportation, and a number of other items.¹² The schedule used in the survey upon which this statement is based required as much as 90 minutes for some of the farms. Transportation costs were five cents per mile.

Total enumeration costs per schedule in the two samples were about the same for all items except transportation and drawing the sample. Transportation costs per schedule were about one-third greater for the farm sample, while three and one-half days were required by a clerk in the County Production and Marketing Administration office for drawing the farm sample as compared to only a few hours in Washington, D. C., for the cluster sample. But total cost per schedule for drawing the farm sample plus one-third of the transportation cost per schedule for the cluster sample was less than 20 percent of the total costs per schedule.

The explanation of similar rates of enumeration for the two samples is in operational aspects of the two methods, based on the amount and form of information in the hands of the enumerator before he went to the field. In the farm sample, the usual situation

¹² "Statistical Investigation of a Sample Survey for Obtaining Farm Facts," by R. J. Jessen, Iowa Research Bulletin 304, pp. 48-53

"The Theory of Sampling," by W. A. Hendricks and others, Bureau of Agricultural Economics and North Carolina State College of Agriculture and Engineering Department of Experimental Statistics mimeographed report, p. 84.

was that the enumerator not only had the name of the operator but that he had recorded on a soils map the exact location of the farm, with the segment boundaries on property lines except for definite areas of nonfarm land specifically located with reference to the property lines of the farm. In the cluster sample the enumerator had located on a similar soils map much larger segments whose boundaries were roads, streams, and other lines that often crossed farm boundaries in this area or irregular topography. Additional time required for travel between farms in the farm sample was offset in the cluster sample by time required in locating farms, determining which families inside the segment were farm operators, and otherwise making sure that all families and all nonfarm land were accounted for.

In considering costs as they may influence choice of a sampling method for use in farm management research, it should be recognized that enumerators are usually staff members and other technically trained personnel and that editing, tabulation, and analysis may involve costs per schedule as great as those of enumeration. In the farm management field, therefore, a more efficient sampling method might still be the one to use if only financial considerations were involved and if enumeration could be done at as low cost per unit of useful information by the less efficient method. Total costs might still be much lower for the more efficient method when the number of schedules is varied to give equally good samples by the two methods.

Conclusions

The samples used in this comparison were small. This is especially true for the one containing only 14 segments and which evidently accounted for the major part of the differences between the two samples by failure to include a representative sample of soils used on farms and therefore of other items associated with kind of soils. Other similarly drawn samples might, as would be expected for larger samples in this area or for samples of similar sizes in other more uniform farming areas, show smaller differences. The area from which these samples were drawn is, no doubt, an extreme situation for sampling farms. However, it may also be observed, extreme cases sometimes illustrate a point most clearly. Therefore, certain observations and suggestions from this comparison and analysis of data from the entire survey may well be set out.

The usefulness of variance for certain items as an indicator of reliability of a small sample of farms, and therefore as an indicator of relative efficiency, may vary with error in the sample and the influence of the error on the item being measured. This is illustrated by a higher degree of uniformity in acres of cropland and number of families farming on farms below average in quality of soils in the area for which this comparison was made. In a comparison of two samples, the use of an item representing an important influence in determining other items on farms may not only show greater variation than other items that are in varying degrees associated with it but may help to explain any errors in the other items or even to indicate them if the influence of the item is known for the area sampled.

Results of this comparison have indicated that the cluster sample may have included a relatively better sample of all families than of farms, and that the land used as cropland on farms in the cluster sample was more representative of all land in the area sampled but not of land used for crops. The location of farms, like the location of rural residents not farming and the location of cropper and other tenant families on farms, is selective. The bases for selectivity in location are different for the various groups, so that members of none of the groups are distributed uniformly with reference either to area or to location of houses. The better soils are selected for farms; convenience to towns and villages and land not well suited to farming are bases for location of rural residents not farming; cropper and tenant families other than farm operators are on the largest farms on the best land. These facts suggest use of a specific selective basis for sampling farms, one that will to the fullest extent possible exclude the influence of other factors as sources of variation or reasons for unnecessarily large sampling errors.

A basis that is satisfactory for sampling all rural resident families in an area might also be satisfactory for sampling the kind of land on which occupied dwellings are located. But for sampling farms for research in farm management in an area in which a relatively large proportion of the rural residents are other than farm operators, a different basis for selection of a sample appears to be in order. The most accurate information available as to number and location of farms is that basis when the sample is to be used for estimating farm distributions and means within a general soils and type-of-farming area. A representative sample of soils used on farms

is essential to a representative sample of farms in areas similar to the one for which this comparison of sampling methods was made, and adjacent farms tend to have similar soils.

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PROFESSOR VAILE AND THE THEORY OF INVERSE CARRYING CHARGES

I AM disappointed that my treatment of inverse carrying charges seems to Professor Vaile "inadequate and unrealistic,"¹ but such a stricture alone might be accepted with reasonable equanimity. Theory always involves abstraction, and so cannot avoid being in some sense inadequate and unrealistic. Professor Vaile, however, charges specifically that the theory which I advanced "makes no start toward explaining" what it aimed to explain, and such a charge requires at least an attempt to remove misapprehensions on which it may rest.

Let me deal first with two comments of Vaile's which appear to be subsidiary, and then return to the major charge.

1. Vaile holds my theory to be unrealistic "... because whenever there are high inverse carrying charges, terminal grain merchants tend to modify their market transactions so that full contractual storage charges are paid on an increasing proportion of the total grain in store." I readily grant that the average return for storage received by a grain merchant who stores both for himself and for others is not measured by the market carrying charge (price of storage). Nor is it measured by the fixed price for contractual storage. The conclusion to be drawn is not that either the market price or the contractual price is unrealistic, but only that neither price by itself measures the return for storage received by that grain merchant. The case differs in no essential respect from that of the producer of a physical commodity who sells in two markets which have different price patterns, for example, a dairyman who sells part of his product as market milk and part to a cheese factory.²

¹ Roland S. Vaile, "Inverse Carrying Charges in Futures Markets," this JOURNAL, August 1948, XXX, 574. His discussion concerns my paper, "Theory of the Inverse Carrying Charge in Futures Markets," *ibid.*, February 1948, XXX, 1-28.

² Vaile may also have underestimated the risk he ran of seriously misleading people unfamiliar with details of the grain trade. The opportunities for giving effect

2. Turning from criticism to suggestion, Vaile holds that "it is not true" (as I wrote) "that

$$P_1 + P_s - P_2 = 0 \quad (1)$$

but rather

$$P_1 + P_s - P_2 = \pm x \quad (2)$$

in which equation P_s is the constant standard charge for storage."

The significance of Vaile's suggestion becomes clearer if we allow P_s to retain the meaning I gave it, under which $P_s = P_2 - P_1$ by definition. Then we may take C to represent the "constant standard charge for storage" and rewrite Vaile's equation (2) as follows:

$$P_1 + C - P_2 = x = C - P_s \quad (2')$$

With this clarification, I can accept Vaile's reformulation, though I do not see what it gains; because C is a *known constant*, it makes little difference whether we undertake to explain P_s or $C - P_s$.

3. We come now to Vaile's charge that my theory "is inadequate because it makes no start toward explaining why the carrying charges are positive at one time and negative at another." I accept this as the main charge because the only merit I claim for my theory is that it *goes farther* than the generally accepted theory in explaining observed price behavior. Vaile has done his part toward permitting a test of effectiveness by applying the conventional theory to a particular set of price observations; I shall undertake to show that my theory serves better.

The problem Vaile poses is to explain price relations between the "December and the following May wheat futures in Minneapolis from 1900 to the present." He observes that persistent inverse carrying charges between the December and the May futures occurred "only in 1921 when the post-war foreign demand still was strong and the domestic crop was short, in 1934-37 when

to the "tendency" he asserts are quite limited, for three reasons: (1) Under conditions which have prevailed during most of the last half century the amount of grain stored by "others" in terminal markets has been small relative to the amount stored by the operators of the elevators, (2) the conditions which have led merchants to store little grain in their own elevators have generally reduced similarly the amounts offered for storage by others, and (3) the terminal grain merchant who elects to store grain for others is not free to choose what proportion of his space shall be used by them. He is required by law to operate any elevator used for public storage as a public warehouse, and to accept any grain offered for storage, to the limit of the elevator capacity. In some states, such as Illinois, he is even prohibited from storing his own grain in any elevator which he uses for public storage.

the crop was seriously curtailed by drouth, and in the recent years of high post-war foreign demand. In all other years there were positive, although varying carrying charges between these two futures." Then he adds by way of generalization "Whenever supply is conspicuously short relative to demand, buyers bid up the cash and nearby prices in their efforts to obtain actual grain of desired quality."

If one asks no more than this by way of explanation, the traditional interpretation which Vaile wishes to retain seems to serve fairly well in such circumstances. But suppose we look a little farther into the facts, taking for example 1936-37, the crop year prior to World War II in which the inverse carrying charges between December and May at Minneapolis were most extreme. From mid-September through early December the price of the May future remained steadily about five cents under the price of the December future; thereafter the difference fluctuated somewhat erratically between five cents and nearly nine cents until the end of December. Average prices for the last full week of September and the first full week of December, and the spread between them in cents per bushel, were:

Week	December future	May future	Carrying charge
September 21-26	129 1	123 9	-5 2
December 7-12	136 9	131 6	-5 3
Price increase	7 8	7 7	- .1

Did the price of December wheat increase because demand became more insistent relative to supply? If so, why did the inverse carrying charge fail to widen correspondingly, in accordance with Vaile's principle of explanation?

Note also that stocks of wheat in Minneapolis for the week ending September 26 were reported as 6,408,050 bushels; for December 12, as 5,681,330 bushels; and that on the following May 1 there remained 3,567,427 bushels in Minneapolis elevators. Most of this wheat was hedged in the futures markets and subject, therefore, to a negative carrying charge. How shall one explain this condition?

To answer these questions, I start with the last and explain that the grain merchants and mills of Minneapolis require "goods on their shelves" and working stocks, and will carry large supplies with no return at all for storage as such, and smaller, but still substantial, supplies when the return specifically attributable to stor-

age is strongly negative. Having taken this view that the price relation between the futures should be considered as the return for storage necessary to induce the carrying of certain stocks by hedgers (or to induce a certain restriction of holdings), I find no difficulty in understanding why it should be possible, and indeed common, for the price relation between futures to remain relatively constant from week to week while prices change.

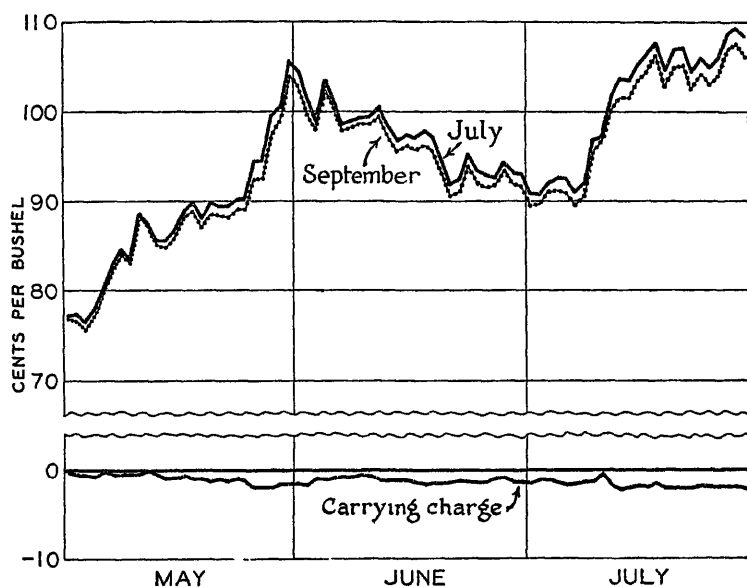


CHART 1.—Daily Closing Prices of Old-Crop and New-Crop Wheat Futures, at Minneapolis, and Price Difference, May-July 1934.

By concentrating attention on a price relation between two futures calling for delivery within the same crop year, Vaile avoids what in other circumstances is a most serious embarrassment to the doctrine that the two prices must be explained separately. If one studies the relation between the July and the September wheat futures at Minneapolis, the one expiring before the spring-wheat harvest and the other after harvest, and takes periods in which spring-wheat crop prospects changed substantially, it appears that the attempt at separate explanation breaks down completely. Consider for example, the period, May-July 1934, when severe drought in the spring-wheat area contributed to a sharp

price advance during May, good rains in early June encouraged a severe price reaction, and in July prices rose again in response to renewed drought in the spring-wheat area, together with a crop report which confirmed that much of the damage done in May had been irreparable.³ Chart 1 tells the detailed story of wide changes in prices of the two futures and negligible change in the July-September carrying charge during these months.

It was such evidence as this which first convinced me of the futility of attempts at separate explanation of prices of different futures. *If, instead, one regards the influences pertinent to the price of the more distant future as bearing equally on the nearer one, and recognizes that the price of the nearer future is affected also by influences which bear specifically on the price difference between the futures, explanation becomes easy.* In this instance we may note that stocks of wheat in Minneapolis elevators, which were 18,672,000 bushels on May 5, declined in normal fashion to 14,647,000 bushels on August 11, and then rose, reaching 16,150,000 bushels on September 1. Most of this wheat was held by merchants and processors who wanted it for convenience and would have held somewhat larger supplies except for the existence of a small inverse carrying charge. Their disposition to hold was virtually unaffected, it appears, by the drastic crop developments of the period.

If Vaile found difficulty in seeing how to apply the ideas which I tried to set out, others must have experienced like difficulty. I hope that the foregoing explanations clarify the main problems.

HOLBROOK WORKING

Food Research Institute

³ For a more detailed account of these developments see M. K. Bennett and Helen C. Farnsworth, "World Wheat Survey and Outlook, September 1934," *Wheat Studies of the Food Research Institute*, XI, (1), pp. 8-11.

BOOK REVIEWS

The Business of Farming, Herrell DeGraff and Ladd Haystead.
Norman: University of Oklahoma Press, 1948, Pp. xviii, 244.
\$3.00.

This book is different. From title through addendum the authors have used a simplified style of presentation which is little used in Agricultural Economics books. The use of self-explanatory terminology rather than stock-in-trade or technical terms and the style employed in writing makes this book outstanding. A practical approach is used throughout the book, and research data is drawn from many sources to explain and illustrate salient points. The authors have presented their material under four headings and in a way which will incite the laymen to utilize a common sense business approach to farming.

Soil management is discussed in section 1, with the basic assumption of "success or failure in farming starts with the soil." In their discussion of soil management, stress is placed on the importance of soil resources available to the farmer on his particular farm and in his particular area. After evaluating the soil resources, various factors affecting the capacities and uses of soil are discussed. The assets as well as liabilities of humus, minerals, manures, and water are covered under the heading of soil management in relation to all sizes and types of farms in the United States. The authors seem fully aware of the magnitude of this problem and have cleverly and adeptly presented this section of the book stressing management problems of various areas of the country.

Equipment management is covered in the second part of the book. The field of equipment management is too often overlooked or passed over lightly in farm management books. The authors have presented facts from various research studies that will be of interest to almost anyone who is farming at the present time. Historical trends in the use of farm machinery are briefly presented. Farm tools are categorized into five classes—tillage implements, crop starting implements, cultivating implements, war implements (sprayers, dusters and weeders), and harvesting tools. A larger part of the discussion on equipment deals with power units. In the discussion on farm machinery, consideration is given to the various items of cost. The use of farm structures and electric power as production tools is included in this section of the book.

The field of labor management is discussed in part three. This section of the book stresses the worth of labor and the various problems a farm manager is concerned with in the use of labor. DeGraff and Haystead have approached labor management from a realistic standpoint. The use of family labor is analyzed in a business light and discussion is devoted to the principles of labor management for family and hired labor.

A discussion of farm organization is presented in part four. In studying farming as a business, the problem of management is a problem that is difficult to evaluate. Adequate research is not available as a basis for evaluating the degrees of good or bad management. The authors have included in this section some of the various techniques used in measuring success of management and discussed choice of enterprises as it relates to success in farming, diminishing returns as a guide to management, use of farm accounts, and importance of farm business analysis to affect success in farming as a business.

DeGraff and Haystead have written a book that will be of interest to the individual farmer because it offers a body of principles which aid in determining problems and their solution. This book will appeal to anyone who is interested in the business approach to farming. It is a practical analysis of farming as a business, well planned, and exceedingly well written.

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Agricultural Economics, Benjamin Horace Hibbard. New York: McGraw-Hill Company, 1948. Pp XXXIV, 433 \$5 00.

"The world that agriculture faces is always changing rapidly." In these words, Professor Hibbard describes the circumstances that make his own most recent book another reflection of economics in transition. Since economics is always in transition, this statement requires elaboration. On page 15, for example, it is stated that "The soundness of subsidies has not been established." Those economists who believe the American economy is or can be made largely competitive, with Government functioning mainly in the role of policeman, will be somewhat surprised at this statement. In their minds, there is not a shadow of a doubt that "subsidies" are "unsound."

On the other hand, those who see the American and other national economies as monopolistic to the core and certain to remain so, with a more or less competitive fringe that includes agriculture and other minor occupations, will call the statement old-fashioned. Professor Hibbard's tendency to stand with one foot on the firm ground of free trade principles while at the same time admitting the necessity for, or acquiescing in, interference is characteristic of our times. Not many economists are clear as to the proper role of Government in the economy.

He arrives at his general position, not by any rational set of abstract principles—or by what some economists would call theory, but by his intimate knowledge of history. He says (on page 44) that even the farmers knew that Coolidge's ideas on farm relief "were old—accepted, and probably out of date, while he (Coolidge) was still an undergraduate."

Dedicated "To my graduate students, 1913-40," this volume is by one of the most human of men ever to write on the subject of agricultural economics. Reared on an Iowa farm in the decades immediately following the Civil War, he felt all the economic, social, and political issues of that time in the Corn Belt. His interpretation of these issues is a part of him and is reflected in this book, which consists of 34 short chapters on subjects he discussed most with his students. After defining agricultural economics very broadly, Professor Hibbard mentions a number of subjects that are included within its scope. He then says he "might have included farm management among the sample subjects," but he didn't. Only those who know and love him will understand why.

This reviewer studied under Professor Hibbard during the second quarter of the period covered by his graduate teaching. Professor Hibbard was a master of repartee. No agricultural economist living then or now would have felt comfortable in public debate with him because of his ability to turn the phrases of his opponent to his own advantage. He engages in this activity at the conclusion of his chapter on the Farmers' Union (pp. 374-376), where he quotes the Union's opposition to trade barriers and isolationism and its support of parity prices. To him, the two positions are inconsistent, but they may be merely more evidenced of economics in transition.

Unfortunately, it has been impossible to register his scintillating humor on the printed page. His tones, accents, and the twinkle of

his eye are missing. And yet, the book does contain some *Hibbardisms*, as we used to call them. On page 9, for example, he says, "Hunger without money makes no appeal except to charity; hunger has never impressed charity at long range, and a faint impression has never evoked great contributions." If we correct the statement by pointing out that hunger without money has made a very great appeal to the fear of communism, we have left a very important economic truth well-stated.

But it will be a surprise to his former students to read on page 12 that a "fair price" is "probably somewhat below the level of prices we pay for what we buy," or on page 14 that it is "twice that of 1934." My notes taken during his lectures say that a "fair price is what you can get, plus 10 percent."

The book gives greatest emphasis to tenancy, tariffs and farmer movements. Considerable attention is devoted to farming as an occupation and to the reasons for both excessive numbers of farmers and surplus farm output. Some of his most acute observations are on these subjects. In a chapter on "Agriculture Under the New Deal," the name of Rexford Guy Tugwell is conspicuously absent. His final chapter entitled "After the Second World War" quotes with approval Mordecai Ezekiel's advocacy of American efforts to aid in the industrialization of foreign countries as a means for expanding world trade. But lest we become too enthusiastic about the possible success of such a program, he warns that "Selfishness is powerful and ignorance is a precipice."

Because, he says, (page 433) "what we most need, and eventually must have, is reestablished world trade," and because he sees the difficulties in achieving that goal, his outlook for the years immediately ahead is somewhat pessimistic. When, as an economist, he says "We are apparently headed for a dreary period such as the thirties . . .," he will be recognized by some as a spokesman for the *dismal science*.

A conspicuous, if not important, weakness of the book is the fact that the most recent statistics used in charts and tables are for 1945. Then, too, if the scope of agricultural economics is as broad as Professor Hibbard's definition, it cannot be taught with this book alone, a fact the author himself clearly recognizes. Too little attention is given to the economics of soil conservation or to the role of monetary and fiscal policy in stabilizing the economy generally—matters of very great concern to farmers today.

Even so, the former students of Professor Hibbard will value this book highly, and it will most certainly serve well the purpose modestly described in the preface, namely—"to make it somewhat easier to present the many aspects of the subject."

BUSHROD W. ALLIN

Bureau of Agricultural Economics

Population Analysis, T. Lynn Smith. New York: McGraw-Hill Book Co., 1948. Pp. xiii, 421. \$4.50.

The recent revival of the gloomy forebodings identified in Economics literature with the name of Malthus are leading economists to reexamine the field of demography, which, in this country at least, has become largely separated from its parent discipline. Smith's book, *Population Analysis*, provides them with an account of the data about population that are available in the United States, along with some notes on data available elsewhere. Nearly every chapter describes the types of data available in the United States, their sources and the weaknesses that exist, and there are occasional suggestions to the agencies producing such data for improvement of their basic materials. Some attention is given to the methods used in extracting meaning from the figures, and numerous conclusions and observations are given. For these the author draws heavily upon his own field studies and analyses of data assembled in Census and Vital Statistics reports. One hundred and sixty-six charts, maps and graphs make more vivid many of the relationships that are mentioned or discussed.

In this manner the reader is led through the several fields that generally are included under the heading of demography. One part deals with those aspects usually grouped as the composition of the population, including residential distribution, age, race, nativity, sex ratios, marital, educational, and occupational status, and religious composition. Another part deals with birth and death rates and their measurement and trend. Migration, both internal and international, are given more attention than is usual in academic treatments of this subject.

The author in the preface states that an attempt has been made to treat the subject in language that can be readily understood by the advanced undergraduate in college or university. This reviewer, who has not recently presented such materials to undergraduates, however cannot help asking whether it is necessary to write down

to undergraduates to the extent that this book does, or to pass over lightly and in some cases deprecatingly the more involved procedures that have been developed for some aspects of population study. In stressing an empirical approach to the study of population phenomena the author clears away much of the wordage that has filled demographic literature. He also gives scant attention to some problems which for the time being must be analyzed with scanty data. Granted that the U. S. in many ways lags behind other countries in respect to demographic statistics the critical appraisal could well have given more attention to the numerous improvements introduced into the 1940 Census. A large number of publications since 1940 give evidence of a continuing program of testing new definitions and new approaches to data. This program has already provided significant new results and promises more for the future.

CONRAD TAEUBER

Food and Agriculture Organization of the United Nations

The Farm Bureau Through Three Decades, O. M. Kile. Baltimore: Waverly Press, 1948. Pp. ix, 416. \$3.50.

This 403 page book, by O. M. Kile, opens with a foreword by Allan B. Kline, president of the American Farm Bureau Federation. This foreword says in part: "The story of the growth and development of the Farm Bureau is one of the great stories in American agriculture. It is important to have that story documented now, while many of the early leaders in the movement are still alive. This book does that."

"Written by a man who served on the information and legislative staffs of the American Farm Bureau Federation in the early days and who has maintained a deep interest in the organization since the beginning, it is authentic and accurate."

"Mr. Kile has rendered a great service to Farm Bureau in recording the story of the organization from infancy to maturity."—

From the foregoing, it is evident that the book is written by one who knows the early history from the inside and that it has the approval of the current president as a semi-official history of the Farm Bureau movement.

It is well-written by one who believes in and defends almost every action rather than from the coldly analytical viewpoint of a hard-

boiled economist. There is good reason to believe that the factual material is authentic. This is indicated by the following from the author's preface, "I am particularly indebted to John J. Lacey, Director of Information, for his careful scrutiny and constructive criticism of the entire manuscript and various revisions thereof, and to W. R. Ogg, Director of the Washington Office, for checking on the accuracy of those matters that have come within the purview of his twenty years in the thick of legislative battles. My thanks go also to Chester Gray for his careful reading of most of the manuscript and for his helpful suggestions."

The main body of the book is divided into seven parts, as follows:

Part I—The Historical Background:

These three chapters cover: 1, earlier farm organizations and what became of them; 2, the beginnings of the County Agent system; 3, the organization of county Farm Bureaus; 4, the organization of county Farm Bureaus into State organizations and 5, the birth of the American Farm Bureau Federation at Chicago, November 12-14, 1919.

Part II—The James R. Howard Administration, 1920-22

These five chapters cover the early activities. Two major ones were:

1. Sponsoring national cooperative set-ups in grain, livestock, cotton, wool, fruit, vegetables and other commodities.

2. Bringing the influence of the organization to bear on Congress. The author gives the Farm Bureau credit for having had a large part in the formation of the "agricultural bloc."

The author credits the Farm Bureau in this period with securing the Capper-Volstead Act, packer and stockyards control, regulation of grain exchanges, and other legislation.

Part III—The Oscar E. Bradfute Administration, 1923-25

These two chapters cover the bitter strife between Aaron Sapiro and his adherents who wished to make the promotion of cooperative marketing of the Sapiro type the big activity—and such men as John Coverdale, secretary and 'O'Neal of Alabama who saw large opportunities in other fields.

Part IV—The Sam H. Thompson Administration, 1926—March 1931

Mr. Thompson, according to the author, understood full well that he was elected with the expectation that promotion of legislation of the McNary-Haugen type was to be a major activity of the organization. The three chapters are largely devoted to the battle over the McNary-Haugen bills and the compromise legislation that resulted in the Federal Farm Board.

Part V—The Edward Asbury O'Neal Administration, 1931-47

These 10 chapters cover the struggles over the major agricultural legislation of the 1930's, the price control legislation of the war period and the post-war period through 1947. The first chapter has the title, "Wedding of the South and the Mid-west." Apparently, in view of the author, the great achievement of President O'Neal was to weld the agriculturists of the South and Mid-West into a smooth working organization that was able to exert much influence on legislation.

Part VI—The Allan B. Kline Administration, December 1947

These three chapters cover the problems confronting the organization as Mr. Kline took over the leadership in December 1947. The author reviews the major activities under way and the membership strength by states with some comparisons to that of other farm organizations.

Part VII—Assets, Problems and Prospects

This part is a concluding chapter in which achievements are summarized and the problems of relations with the State Extension Services, County Agricultural Agents, relations with other farm organizations and with the public, are considered.

The author says, "Probably the greatest accomplishment of the Farm Bureau in its three decades of existence has been to establish a 'voice' for agriculture."

"While there may at times appear to be several 'voices' in the agricultural field, few would deny that the American Farm Bureau Federation is the recognized voice. Others are heard respectfully and on some subjects have influence but any legislative or adminis-

trative measure dealing with agriculture that is opposed by the AFBF is not likely to get far."

Since the Farm Bureau has been on one side or other of much of the agricultural legislation that has been considered by Congress since 1920, the book, to a considerable extent, is a history of agricultural legislation proposed and enacted since that year. It gives considerable light as to what went on behind the scenes.

WM. L. CAVERT

Farm Credit Administration of St. Paul

Labor Productivity Functions in Meat Packing, William H. Nicholls. Chicago: University of Chicago Press, 1948. Pp. xviii, 256. \$5.00.

Professor Nicholls has submitted the record of fluctuations of inputs of hogs, men, hours, and payrolls for two years in a mid-western packing plant to a very detailed statistical analysis. His purpose is to approximate "the static short-run production and cost functions of economic theory" (p. 51). His objective seems to me a mistaken one; his achievement of this purpose is almost impeccable.

Why should anyone want to approximate the textbook curves, except possibly to supply illustrative material for more textbooks? Suppose one finds, as Nicholls often does, diminishing marginal returns to labor—then surely the complacent theorist will simply say, "I told you so." Suppose one finds, as Nicholls also often does, increasing marginal returns to labor—then the complacent theorist will say (in fact theorist Nicholls does say), "These results cast considerable doubt on the accuracy of the [results] obtained in this investigation." (p. 15) (I think this is as wrong a first reaction as is the superficial alternative of rejecting the theory.) This is not quite fair to Nicholls because he does investigate one relatively neglected problem (discussed below), but it is a substantially accurate description of his approach. He is not testing economic theory, nor is he enlarging or improving it—he is simply illustrating it.

Given his goal, the performance is exemplary. The data are carefully described and reproduced; the technical background of the industry is adequately summarized; the statistical calculations are reported in sufficient (and perhaps in excessive) detail; and the conventional theory of cost curves is stated carefully. His standards of craftsmanship deserve high praise and wide imitation. The only questions I would raise concerning the performance are triffl-

ing, e.g., his third general conclusion is inconsistent with the first two if one disregards words like "nearly" and "slightly" (p. 24).

One problem of cost curve analysis is given new prominence. the selection of the optimum combination of men and hours of work per week to minimize the labor cost of a given output. As a formal problem it introduces no new principles (Ch. IV); it is analogous to the choice between durable and non-durable machinery except for the absence of interest complications. The tendency of the findings is that in this particular plant the number of men is subject to diminishing returns but the work-week is not (within the range of variation considered), so costs could have been reduced slightly by using fewer men on longer work weeks.

I would, however, enter a vigorous dissent from the use of the "let sleeping dogs lie" theory of welfare economics implicit in Nicholls' discussion of the Fair Labor Standards Act. He argues that the Administrator did not apply the overtime provisions with due allowance for the nature of meat-packing, but that no change in policy is now called for because the industry has become adjusted to the mistaken ruling. If Nicholls will apply this theory to silver legislation and entrenched monopolies he may come to share my dissent.

GEORGE J. STIGLER

Columbia University

Rural Sociology, Lowry Nelson. New York: The American Book Company, 1948. Pp. xvi, 567. \$4 25.

Of the many rural sociology textbooks no two follow the same plan of treatment due to the various authors' pedagogical judgments but also undoubtedly due to the fact that general courses in rural sociology are quite differently oriented to the college curriculums of different types of institutes. The early rural sociology textbooks were primarily surveys of rural social problems and issues. The recent trend has been for them to include general sociology or theoretical orientation for the rural social situations and problems dealt with. Dr. Nelson's book is as successful as any in this latter undertaking.

Another reason for the lack of standardization or of evenness of treatment in rural sociology textbooks is that no one author can be expert in all fields and each naturally, therefore, writes some excellent and generally some mediocre chapters. This is probably the

only way to meet the problem with which an author is confronted. Some of the most successful textbooks for those whose only course in sociology is a course in rural sociology do little more than survey the research findings which have been developed over the last 30 years, compile numerous statistical tables and make some practicable application of the data which they present. Such books are naturally very inadequate in sociological treatment. Undoubtedly other authors go too far in the opposite direction, include considerable sound sociology but very often make very little application of it to specific rural social situations. Some of these latter have very strong chapters in the fields of the author's specialty and other chapters are often weak. The author of this book follows this second plan but by and large does it quite successfully. He covers all of the basic topics with which all rural sociology deals and each chapter contains a sound sociological orientation.

Some chapters are very successful in handling topics which other authors, specialists in given fields, over-emphasize and because of this over-emphasis are weak at other spots in their books. Examples of successful balance in this book are Chapter 5 on The Rural Community, Chapter 6 on The Rural Population, Chapter 11 on Stratification and Social Status, and Chapter 16 on Levels of Family Living.

A number of chapters are excellent, probably superior in many ways to those in other rural sociology textbooks, superior in their sociological orientation by means of introductory statements, and definitely follow through with the practical application of that sociology in the detailed presentation of data and in discussion and interpretation. These chapters are Chapter 15 on Marriage and the Rural Family, Chapter 17, Religion and the Rural Church, Chapter 24, Rural Welfare, and Chapter 25, Health and Health Agencies. The last chapter on the Outlook for Rural Life is also good but would be better if it were more ample. The author provided materials in his own textbook for amplification of this chapter.

This text gives evidence of the maturity in scholarship and philosophy of its author. It will be very useable as a textbook in general rural sociology so far as the college student is concerned and it makes a definite contribution to other sociologists who are working in the field of rural sociology.

CARL C. TAYLOR

Rural Life in Argentina. Carl C. Taylor. Louisiana State University Press. Baton Rouge. 1948. Pp. vii, 464. \$6.00.

Rural Life in Argentina, contains all of the aspects of our national agricultural life, described with clarity and notable erudition.

All of the farm areas have been visited personally by the author and carefully observed. We can note the systems of production as well as the mentality of the Argentine farmer, who, because of his southern European origin, presents special characteristics, which attract the attention of the American investigator, on comparing him with the North American farmer, and the physiognomy into which he fits, thus, making a clear judgment of the nature and magnitude of the elements which participate in this complex phenomenon.

The method utilized by Dr. Taylor in this book is one which is advised by the most modern technique in the subject matter of investigations of this type. It has permitted him to expose in an orderly fashion a profound and thorough study of the panorama which our agricultural economy offers, in the internal as well as the external economy of the enterprise. An important analysis of the social scene in which our agricultural phenomenon takes place, and the consequences of the particular facts are studied along with the rest of the cultural, economic, moral, and political, etc. activities, typical of our peoples.

A year of daily investigation, visiting areas, reading the most noted authors who have been concerned with this subject, conversing with the farmers themselves, business men, sociologists, statisticians, research workers, etc., permitted the author to accumulate a wide fund of information, which conditioned by the actual reality of the situation, put him in position to write a book which is a faithful picture of our rural life.

One observes without any effort the sociological orientation of the author of *Rural Life in Argentina* because of the attention which the study of the man-factor and of that of social institutions, such as the family, the school, the church, etc., receives; topics, which the author presents with many statistical charts and illustrations, studying our agricultural worker also in the light of the functioning of the urban phenomenon, in order to draw conclusions which include the rural medium and its bearing on the rest of the population.

When the North American reads this book, he will have a clear and complete concept of what our weight is in the international market of farm products, and, also, he will be able to form conclusions about our culture, our institutions, the working capacity of the people, etc. As a result of this we Argentines and North Americans will understand each other better. Dr. Taylor's book has made an enormous step which will serve as an extraordinary contribution in the procuring of a real collaboration and mutual respect between both nations.

Rural Life in Argentina is a book within the reach of all levels of culture, because it is written with a lucid and simple style, without sacrificing anything of profundity; it is ample in its scope and given to an admirable sincerity. Likewise it is a work which ought to be known and studied by every student of these questions, because it is a faithful reflection of our reality, and it is, as well, a book for all of the reading public.

RAUL GARCIA

Assistant Professor of Economics
National University of Córdoba, Argentina
Before the Perón Regime

Future Food and Agriculture Policy John D. Black and Maxine E. Kiefer. New York: McGraw-Hill Book Co., 1948. Pp. viii, 348. \$3.50.

This is an important book, not only because it deals with a significant current problem, but also because it is an authoritative statement by a leading agricultural economist who has been steeped in the problem for many years. There is no way of detecting the specific contributions of the senior and junior authors, but the style and positiveness of statement are characteristic of the senior author. His hand is apparent in every part of the book.

Part I deals with the facts regarding food, nutrition and agriculture in 1947 in the United States. The remainder of the world is covered in less detail. These data are well known to workers in the field but their summarization and selection are excellent.

Part II deals with the parts of the problem. Except for the very short run, the basic problem is that of the ratio of the population to food-producing resources. This relationship is very bad in a considerable portion of the world and the authors are generally pessimistic with respect to the future. After reviewing estimates of the productive resources of the world and potential trends in popula-

tion and output, the authors reach the conclusion that, "... except in the newer countries and in those with possibly expanding frontiers, the foods needed for a continuously expanding population cannot be produced. In some of them the foods needed for adequate diets for their present populations cannot be produced within their own boundaries" (p. 147) The answer must lie in population control which is a difficult and long-time adjustment. The authors are emphatic that the haves should not level themselves down by direct sharing with the have-nots. They say, "... and as for the general argument that the countries with good diets should share their foods with the people of the densely populated regions, one has only to point out that, if they had done this in the last 300 years, most of them would now be down close to the Malthusian level of subsistence. The hope of the world is in the countries which have escaped such a fate and can now help the rest of the world to escape from it." (p. 169) Black has always been an advocate of specialization and freer trade, but like many of us views the removal of existing trade barriers and trade restrictions as improbable in the foreseeable future. We shall, therefore, have to get along for a time as best we can with them.

Part III develops the programs which the authors consider essential for the solution of the problems presented in the earlier section. The most important chapter is XXI which outlines in concise form the senior author's agricultural program for the United States. Dr. Black would establish an annual national quota for each crop but no individual producer quotas. If the actual crop exceeds the quota, producers are entitled to payments, if any, only on the proportion of their sales which the established quota constitutes of the total crop. The crop is to be sold in the market for what it will bring, with supplemental payments made to the farmer to bring market prices to "total prices" when the former are lower. The very interesting suggestion is made that these supplemental payments be made to the farmers as grants-in-aid on a 50-50 basis for approved production practices or investments in the farm following the adoption of a long-time individual farm program. This program is to be approved by experts. This form of payment seems to the reviewer to possess real advantages. In the nutrition portion of the problem, the proposals are not as precise. The view is expressed that, "nothing short of a vigorous program of direct food distribution measures will meet the needs of the situation facing

this country and the world in the next ten years." (p. 223) The funds for both the agriculture and the nutrition program are to come from the treasury. "The logical procedure is to make a joint appropriation large enough to cover both, and to distribute the sum between them each year in whatever way will contribute most effectively to the two objectives—raising and stabilizing agricultural income and improving diets " (p. 224) The cost is estimated at about two billion dollars in a normal year.

The last seven chapters which constitute Part IV are devoted to problems of execution. The authors indicate that a great deal of attention has been given to these phases of the work. The basic problems, however, remain unsolved. Economists may formulate excellent programs but are frequently unable to implement them. In view of the present temper of Congress and the apparent aims of farm leaders, one fears that the program of the authors stands little hope of adoption. Nevertheless, it is worthy of careful study.

WARREN C. WAITE

University of Minnesota

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REPORTS

Report of the President, 1948

Our Association has vigor and vitality. The contributions which the officers and other members have made when called upon to serve have been most gratifying. To quote chapter and verse I refer the reader to the reports appearing at the end of the November 1948 issue of the JOURNAL. These reports give an excellent summary of the activities during the year.

I wish to express my gratitude to Frederick V. Waugh who, in my estimation, has made an outstanding contribution to the Association during the year in serving first as chairman of a policy committee and second, as chairman of a committee to formulate a procedure for the administration of our special awards program.

Julius Hendel as chairman of the group designated to raise the funds for the special awards has been unusually successful. His work and that of his colleagues, H. B. Arthur and A. C. Hoffman, in raising over \$13,000 provide an excellent example of outstanding service for the Association by members who believe in its future.

This past year the vice presidents were given heavy assignments which they accepted cheerfully. Earl Butz tackled the student chapter assignment and served on the policy committee. His report on student chapters at the annual meeting and the action of the membership at that meeting in approving a constitutional amendment providing for student chapters marks, I believe, a milestone in our Association history.

Harold Hedges, our other vice-president, tackled the annual meeting problem. His report in the November 1948 JOURNAL charts a new course for the Association, the holding of annual meetings in the summer in different parts of the country affording a larger opportunity for cooperation with affiliated groups. I hope it will be possible following our meeting with the Western Farm Economic Association at Laramie, Wyoming, in 1949 to have similar meetings with the Canadian Agricultural Economics Society and the agricultural economists of the South. This is a worthy experiment in my estimation provided we expand our meeting each year with the American Economic Association, the American Statistical Association and allied groups. If we are to maintain our hybrid vigor I consider it imperative that we not lose contact with our parent strains—particularly economics and statistics.

A complete index of the JOURNAL was recommended by the Executive Committee. Harold Hedges initiated negotiations with the Washington, D. C. chapter of the Special Libraries Association for the preparation of such an index. It appears likely that such an index will be completed in 1949. We hope it will be possible to publish this in combination with a directory of the membership.

The high standard which our JOURNAL has attained is evidence of the vitality of our Association. I am sure I speak for the membership in extending to Warren C. Waite, retiring editor, our thanks for a remarkably fine editorial performance.

The growth of our membership presents us with new problems. An important one is the added burden placed on our secretary-treasurer Larry J. Norton, who is retiring this year as secretary-treasurer, has made a convincing case in his report in the November issue of the JOURNAL for added financial aid for the office of the secretary-treasurer. I believe, as he says, that the Association will grow more rapidly if added financial assistance is provided.

Progress this year has been made on the volume of readings on agricultural policy. O. B. Jesness accepted the editorship with an advisory council of H. DeGraff, F. F. Elliott, L. P. Gabbard and H. R. Wellman. Dr. Jesness reports as this is written that the material is almost ready for the publishers.

At this point I want to express appreciation for the assistance I have received from my three immediate predecessors, Asher Hobson, Frederick V. Waugh, and Larry J. Norton. Many of our accomplishments this year are a result of policies initiated while they were president of the Association.

In passing the baton to our next president, O. V. Wells, I have two suggestions. First is the need for a study of our constitution including some change in our election machinery to make for more continuity in our officers. This year all four officers and the editor are changing. The fact that a new president may have had no contact with the executive committee prior to his election is, I believe, a serious handicap. The necessity to carry forward projects for several years plus added activities such as the special awards program and student chapters make it desirable that we elect a president a year in advance either as a vice-president or as a president-elect.

My second suggestion is the need for a wide participation in the preparation of the programs. The AFEA has expanded to a point where it is difficult for the president to prepare the programs without considerable assistance. Since some of the meetings are now being planned over a year in advance, a president-elect might be a welcome aid to the president, especially if one of his duties was service on the program committee.

In closing I want to express my thanks to you, the membership, for your splendid support. This year as your president has given me a satisfaction for which I am deeply grateful. I wish for the Association continued expansion in members, vitality and service to our profession.

WILLIAM G. MURRAY, *President*

Report of the Editor

Volume XXX of the JOURNAL consisted of four regular issues totaling 852 pages. The proceedings of the Green Lake meeting will be published as Part II of the February 1949 issue.

The JOURNAL is a cooperative venture of the Association. This is indicated by the fact that 89 different persons contributed to it in the way of articles, notes and reviews. The Editor wishes to thank these contributors and the others for whom space limitations prevented publication for their generous cooperation. He also wishes to express his thanks to the Editorial Council and the Associate Editors for their continued interest and support. It is with regret that these associations are terminated.

The Executive Committee has authorized the preparation of an index to cover the first thirty volumes of the JOURNAL and has arranged with the Washington Chapter of the Special Library Association to carry out the task. The final arrangements have been left for the incoming Editor since the index will not be completed for some time.

The Distinguished Publication Award of the American Farm Economic Association for the year 1947 was made to Mr. Willard W. Cochrane for his article on "Farm Price Gyration—An Aggregative Hypothesis" which appeared in the May 1947 issue of the JOURNAL. The committee selecting the paper was composed of F. V. Waugh, F. F. Hill, E. C. Young and the Editor. In view of the new special awards grants the Executive Committee might well consider the desirability of continuing this award. If it is continued, selection might well be made by a broader committee than has made the earlier selections. The Editorial Council as a whole would appear a suitable group. A suitable plaque or memento should accompany the award.

There were 33 articles with 4 accompanying discussions, 23 notes and 30 reviews in the JOURNAL the past year. The division of the printed matter was as follows:

<i>Issue</i>	<i>Articles including discus- sions</i>	<i>Notes</i>	<i>Reviews</i>	<i>News items</i>	<i>Annual reports</i>	<i>Other</i>	<i>Total</i>
February	141	26	18	7	6	6	204
May	121	47	18	6	3	5	200
August	159	34	15	10	0	6	224
November	131	34	20	7	14	18	224
Total	552	141	71	30	23	35	852

The quality of the JOURNAL depends upon the contributions which come largely from the members of the Association. The Editor and even the Editorial Council cannot possibly be aware of all the prospective articles of high quality which should appear in its pages. It is the responsibility of everyone in the Association to direct suitable material toward its pages and to inform the Editor of prospective sources of outstanding contributions.

Respectfully submitted

WARREN C. WAITE
Editor

Report of the Auditor

In accordance with the request of the President of the American Farm Economic Association, I have examined the accounts of the Secretary-Treasurer, Professor L. J. Norton, for the year ending November 30, 1948. I have checked vouchers, cancelled checks, bank debit slips, and bank statements with expenses as shown in the treasurer's books and found the book statement of expenses correct.

I have checked bank deposit slips, bank credit slips, and bank statements with receipts as shown in the books and found the book statements of receipts correct. I have checked the bank balance on November 30, 1948, with the books and found them in agreement. I have inspected the stock certificates and bonds kept in a safety deposit box in the Champaign National Bank, Champaign, Illinois, and found them as stated in the treasurer's annual report.

I have checked the treasurer's annual report, as prepared by the secretary-treasurer, with the books and found them in agreement.

Respectfully submitted,
R. H. WILCOX, Auditor
December 10, 1948

*Report of the Secretary-Treasurer for Fiscal Year Ended
November 30, 1948*

Membership. Membership and subscriptions totaled 2,007 at the end of the fiscal year, distributed as follows:

	1946	1947	1948	Increase
Individual members	965	1,124	1,269	145
Junior members	79	106	178	67
U. S. libraries and firms	244	327	324	-3*
Foreign libraries and firms	160	205	230	25
Exchanges	11	11	11	0
Total	1,459	1,773	2,007	234

* Includes cancellation of one large multiple subscription.

New members or subscriptions were as follows:

Individual members	179
Junior members	126
U. S. libraries and firms	38
Foreign libraries and firms	83
Total	436

Finances. In spite of much higher printing costs caused by higher rates and the supplement to the November 1947 issue, the Association had a small net operating income and after allowing for investment income, cash income exceeded expenses by \$2,062.54. The rate of return on the Association's securities (cost basis) was 3.67 percent.

Contributions to the Special Award Fund totaled \$13,425. United States Treasury Certificates (1½ percent) were purchased in the amount of \$15,000

REPORTS

Operating Income and Expense
Year Ended November 30, 1948

		1948	1947
<i>Operating income</i>			
Net receipts from dues	\$10,080 90		
Back numbers sold	1,124 11		
Reprints sold	1,174 15		
Advertising sold	90 00	\$12,419 16	\$9,362 36
<hr/>			
<i>Journal printing</i>			
Four issues and November supplement	\$ 9,409 78		
Five reprints	907 35	\$10,317 13	\$6,151 58
<hr/>			
<i>Operating Expenses</i>			
American Institute of Cooperation	25 00		
Annual meeting	381.15		
Back numbers purchased	219 00		
Best Article Award, 1947	100 00		
Editorial expenses	77 31		
Executive committee meeting	528 78		
Library custodian expenses	52.29		
Office supplies	116 12		
Postage and wires	186 10		
President's expenses	142.27		
Secretary's expenses	96.15	1,924.17	1,624 08
<hr/>			
Total expenses		\$12,241 30	\$7,755 66
<hr/>			
Receipts above expenses		177 86	1,586 70
Dividends and interest		1,805 25	1,073 66
Sales of stocks and rights received on dividends		79 43	142 29
<hr/>			
Total receipts above expenses		\$ 2,062.54	\$2,802 55

Financial Statement
December 1, 1948

<i>Assets</i>	
Cash	\$ 6,035 16
Stocks, market value	17,849 75
U S bonds and certificate	48,895.10
<hr/>	
Total	67,779 91
<hr/>	
<i>Liabilities</i>	
Reserve for Special Grants Fund.	\$13,425 00
Net worth.	\$54,354 91

Adjustments in Net Worth

Net worth, December 1, 1947	\$53,603 31	
Net income, 1948	2,062 54	
Increase in value, U S bonds	45.00	\$55,710 85
<hr/>		
<i>Deduct</i>		
Amortization on bonds to par value	199 46	
Stocks and rights sold	70 23	
Decline in value of stocks held	1,086 25	1,355 94
<hr/>		
Net worth, December 1, 1948		\$54,354 91

Respectfully submitted,
L. J. NORTON, *Secretary-Treasurer*

NEWS NOTES

The Seventh International Conference of Agricultural Economists will be held at Stresa, Italy, August 21 to 28, 1949. Stresa is on Lake Maggiore in Piedmonte, with hills rising steeply from the shores of the lake and the Alps beyond. Few places in the world can combine such facilities for holding a conference with a wealth of natural beauty. If possible, it is planned to organize two tours in connection with the Conference, one before and one after, each lasting approximately one week. The tour following the Conference is to be in Italy, with three days in the agricultural regions of the Po Valley, and the rest of the time in the region of Florence and Rome. The one before the Conference is designed to meet the needs of people who will arrive at English Channel ports, and it is planned to spend a week visiting farms and sight-seeing in Belgium, France, and Switzerland.

Anyone interested in attending the Conference should notify J. R. Currie, Research Department, Dartington Hall, Totnes, Devon, England, sending copy of his letter to E. C. Young, Purdue University, Lafayette, Indiana.

The American Institute of Cooperation will hold its annual Summer Institute on the Campus of the University of Wisconsin August 22-25.

A Farm Construction Section has been formed in the Division of Agricultural Finance of the Bureau of Agricultural Economics, with Roy J. Burroughs in charge. Research and service activities in reference to housing and farm service buildings will cover finance, supply, prospective volume of construction, and formation of capital. Dr. Burroughs is also teaching two courses during the second semester—one in economic principles at the Department of Agriculture Graduate School and one in housing finance at American University.

A land classification study is being made of Haywood County, North Carolina, Jefferson County, Tennessee, and Graves County, Kentucky. Cooperating agencies are Bureau of Agricultural Economics, Tennessee Valley Authority, Soil Conservation Service, and the agricultural experiment stations of the three states. S. W. Atkins, BAE, is coordinating the study.

The Iowa State College has announced a Land Economics Institute from June 13 through July 20, 1949. The Institute is dedicated to a better understanding of our major land problems and what can be done about them. All courses in the Institute carry graduate credit and are designed to fit the needs of (1) educational and research workers, (2) administrators of land programs, (3) students working towards advanced degrees, and (4) all people desiring a better understanding of our basic land problems and analyses of alternative solutions.

In addition to a wide selection of courses in land economics and related fields a special seminar in Land Problems and Policies will be offered. This seminar will include lectures and discussions conducted by outstanding students of land problems from different sections of the nation.

A folder describing the Institute in more detail may be obtained upon request to the Economics and Sociology Department, Iowa State College, Ames, Iowa.

The Hyderabad Government has invited Mr. A. W. Ashby, C.B.E., M.A., who is the Director of the Agricultural Economics Research

Institute, University of Oxford, to assist in a review of provisions for research and teaching in agricultural economics.

G.H. Aull, Head of the Department of Agricultural Economics and Rural Sociology at Clemson College, was recently elected President of the Southern Economic Association.

William B. Back has returned to the Farm Economics staff of the University of Kentucky after spending 15 months at the University of Chicago and Iowa State College where he was engaged in further graduate work toward the Ph.D. degree.

Charles K. Baker is on leave from the Extension Service, Agricultural and Mechanical College of Texas, to work with the cooperative Research and Service Division, Farm Credit Administration on a study of citrus marketing costs under the Research and Marketing Act.

E. Lloyd Barber, who for the last year has been doing research in farm mortgage distress for the National Bureau of Economic Research, has returned to the Bureau of Agricultural Economics and is in the Short-term Credit Section of the Division of Agricultural Finance.

Earl H. Bell has accepted a position as professor of sociology in the Maxwell School of Citizenship, Syracuse University. Dr. Bell was for 8 years a social scientist on the staff of the Bureau of Agricultural Economics. He recently returned from a year in Warsaw, Poland, where he headed the work of the United Nations International Emergency Children's Fund in the distribution of milk and food supplies.

Charles E. Bishop, assistant in farm management at the College of Agriculture, University of Kentucky, is on a year's leave of absence to engage in graduate studies leading to the Ph.D. degree at the University of Chicago.

James O. Bray of the Department of Agricultural Economics, Purdue University, has been awarded a Sears Roebuck Fellowship in Agricultural Economics at the University of Chicago, where he will undertake graduate studies toward his doctorate.

Robert J. Byrne, who was associated with the Traffic Department of Cities Service Oil Company, Chicago, Ill., has joined the staff of the Transportation Section of the Cooperative Research and Service Division, Farm Credit Administration.

W. Edwin Christian, Jr., who has been pursuing graduate study at the University of Chicago for the past year and a half, has been appointed Associate Professor of Marketing in the Department of Agricultural Economics, at Mississippi State College, and will begin his teaching and research work January 1, 1949.

William E. Christian, who has been doing graduate work at the University of Chicago, joined the staff of Agricultural Economics and Rural Sociology at Mississippi State College, January 1. He has the rank of associate professor and will devote his time to teaching and research in the field of marketing.

Frederick A. Coffey was recently appointed to the staff of the Bureau of Agricultural Economics and was assigned to the Prices Paid Section of Agricultural Estimates. Dr. Coffey, who recently completed a tour of duty in South America, transferred to the Bureau from the Institute of Inter-American Affairs.

Martin R. Cooper of the Bureau of Agricultural Economics was a member of a Farm Machinery Mission of the Economic Cooperation Adminis-

tration which was sent to Europe, Asia, and Africa to study the needs of the several Marshall Plan nations for farm machinery. M. A. Sharp, University of Tennessee, headed the Mission and other members were Tom C. Allington, farmer of Suno, Nebraska; Basil W. Berg, Department of Commerce, Willard Monson, Industry Division of ECA; R. B. Gray, Bureau of Plant Industry, Soils, and Agricultural Engineering, and Montell E. Ogden, Office of Foreign Agricultural Relations. The group left in October and returned to this country the middle of December.

Ivan L. Corbridge, who has been doing graduate work at the University of Chicago, is joining the faculty of the Department of Agricultural Economics at the State College of Washington, Pullman, Washington beginning January 1, 1949.

Bascom K. Doyle joined the staff of the Department of Agricultural Economics and Rural Sociology at Mississippi State College on September 1 as assistant professor. His work will be in marketing. He was formerly in the Department of Agricultural Economics at Louisiana State University.

Miss Margaret I. Dunbabin has joined the staff of the Agricultural Prices Support Board in Ottawa and will be associated with the staff of the Agricultural Economics Division, Department of Agriculture in research work for the Board. Miss Dunbabin was recently employed in economic research by the Farmer's Union in London, England.

William A. Faught joined the staff of the Department of Agricultural Economics and Rural Sociology at Mississippi State College, September 1, as regional project leader for the Cotton Marketing Project. He was formerly with the Federal Reserve Bank of Dallas.

Paul J. Findlen, who since May 1942 has been fruit and vegetable marketing economist in the Division of Agricultural Economics, Federal Extension Service, has accepted appointment as program review officer to the Economic Cooperation Administration mission to Ireland. Dr. Findlen left Washington for Dublin on November 23.

R. K. Froker was appointed Dean of the Wisconsin College of Agriculture and Director of the Agricultural Experiment Station and of Agricultural Extension on October 16, 1948 to succeed Dean Ira Baldwin who was promoted to the Vice-Presidency of the University.

James P. Gaines, formerly at Louisiana State University, joined the staff of the Department of Agricultural Economics and Rural Sociology at Mississippi State College, January 1 as assistant professor. He will do full-time research in farm mechanization.

D. J. Gillis, Director of Agriculture for Newfoundland was in Ottawa recently to confer with agricultural officials, including those of the Agricultural Economics Division, with reference to the extension of services to Newfoundland when that colony becomes the tenth province of Canada in 1949.

Gertrude Gronbeck has returned to the Bureau of Agricultural Economics and is on the staff of the Division of Statistical and Historical Research. She spent the last year with the Danish Agricultural Council in Copenhagen.

Herschel N. Hadley has transferred from the Office of the State Statistician in Seattle to the Washington Office of the Bureau of Agricultural Economics. He is working with prices paid by farmers for services.

I. Keith Harrison has returned to the Bureau of Agricultural Economics

after two years of work in the Bureau of the Census on the 1945 Census of Agriculture. He is assigned to the Section of Farm Costs and Returns of the Division of Farm Management and Costs.

Carl P. Heisig, Head of the Division of Farm Management and Costs, Bureau of Agricultural Economics, visited the principal agricultural areas of Brazil, in his capacity as adviser on agriculture to the United Section of the Joint Brazil-United States Technical Commission which convened in Rio de Janeiro early in September. Mr. Heisig returned to the Bureau early in December.

Walter A. Hendricks returned to the Bureau of Agricultural Economics from Germany late in October. While there he completed the analysis of yield data on rye, wheat, and potatoes collected by objective measurements during the summer. He also made an objective check of the land utilization census.

Clifford G. Hildreth of Iowa State College is joining the faculty of the University of Chicago as of January 1, 1949, where he will carry forward researches in agricultural economics and in the Cowles Commission jointly.

Jimmye S. Hillman, who has been teaching in the Department of Agricultural Economics and Rural Sociology at Mississippi State College, is on leave this year for graduate study at the University of California.

Asher Hobson of the University of Wisconsin who has been on leave of absence for a year during which time he travelled through many of the European countries will return to the Department February 1, 1949.

George E. Hodsdon, after a brief stay in the Poultry Section, Cooperative Research and Service Division, Farm Credit Administration, was recalled by the Air Force to serve as major with the 1st Airlift Task Force in Germany.

Donald C. Horton of the Division of Agricultural Finance, Bureau of Agricultural Economics, is teaching a course in the Economics of Agriculture at American University during the second semester.

W. E. A. Husmann, professor of agricultural economics at Clemson College, was recently qualified as an "accredited" farm manager and appraiser by the American Society of Farm Managers and Rural Appraisers.

Roy B. Johnson has accepted a position as assistant statistician in the office of the State Statistician at Gulfport, Mississippi. Mr. Johnson was formerly research associate in agricultural economics at the Louisiana State University.

Lawrence A. Jones, who for the last year has been doing research in farm mortgage distress for the National Bureau of Economic Research, has returned to the Short-term Credit Section of the Division of Agricultural Finance, Bureau of Agricultural Economics.

Harold F. Kaufman joined the staff of the Department of Agricultural Economics and Rural Sociology at Mississippi State College, July 1, as professor of rural sociology and coordinator of the rural sociology work in the college. He will do teaching, extension and research in rural sociology.

Edward E. Kern and Warner L. Bruner, formerly graduate assistants, have accepted appointments as research associates in the Department of Agricultural Economics at the University of Louisiana.

Ben T. Lanham, Jr., is accepting a position in the Department of Agricultural Economics at Alabama Polytechnic Institute as economist. He is returning to the department after a year spent in operating the home plantation in South Carolina.

Alvin T. M. Lee, formerly with the Bureau of Agricultural Economics, has transferred to the Agricultural Division of the Bureau of the Census. He is working primarily on economic classification of farms in the 1950 Census.

J. N. Lewis, agricultural economist, Canadian Department of Agriculture, who for the past five years was associated with the work of the Combined Food Board and the International Emergency Food Council in Washington, has returned to his position in Ottawa.

D. A. B. Marshall, agricultural economist of the Economics Division, Department of Agriculture, and Editor of the Division's publication "Agriculture Abroad" has resigned to accept a position as agricultural trade commissioner in the Department of Trade and Commerce.

E. H. Matzen, formerly associate professor in agricultural economics at the University of Missouri, has joined the staff of the Cooperative Research and Service Division, Farm Credit Administration, to work in the field of cooperative dairy marketing.

D. G. Miley, head of the Department of Agricultural Economics and Rural Sociology, Mississippi State College, was transferred to Superintendent of the Delta Branch Experiment Station, Stoneville, Mississippi, September 1, 1948.

Kenneth A. Monson has been appointed fieldman in farm management at the South Dakota State College of Agriculture.

Howard W. Ottosen was appointed to an instructorship in farm management at the Iowa State College beginning January 1949.

H. L. Patterson, formerly in charge of the Dominion Economics Division office at the University of Manitoba, has resigned to become Director of Cost Studies for the Department of Agriculture of Ontario with headquarters at Toronto.

Harald A. Pedersen, formerly in graduate study in the University of Wisconsin, joined the staff of the Department of Agricultural Economics and Rural Sociology at Mississippi State College, September 1, as assistant professor of rural sociology. He will divide his time between teaching and research in this field.

Raymond J. Penn was appointed chairman of the Department of Agricultural Economics at Wisconsin to succeed Dean Froker who held the chairmanship during the past year.

A. Lionel Perry is returning to the University of Maine as assistant agricultural economist in marketing, February 1, 1949. He has been pursuing work for a doctor's degree at the University of Missouri.

Byron S. Peterson transferred from the Office of the State Statistician in St. Paul to the Washington office of the Bureau of Agricultural Economics. He is currently working with prices received by farmers.

Stanley J. Provost has joined the staff of the Division of Farm Management and Costs of the Bureau of Agricultural Economics and has been assigned to the Costs and Returns Section.

E. P. Reid and G. P. Boucher, agricultural economists of the Economics Division, Canadian Department of Agriculture, who have been engaged in graduate studies at the Universities of Wisconsin and Minnesota respectively, have returned to Ottawa to resume their work with the Economics Division there.

Arthur Roth, Jr., has been appointed to the Western Agriculture Section, Division of Farm Management and Costs, Bureau of Agricultural Economics. He is stationed at Bozeman, Montana, where he is working on adjust-

ments, costs and returns of cattle and sheep ranches in cooperation with the Montana State College of Agriculture.

Charles F. Sarle of the Bureau of Agricultural Economics is due to return from Japan about the middle of January. His assignment with the Army in Japan involved the expanded use of objective samples for estimating crop production.

Douglas F. Schepmoes has joined the Land Economics staff of the Bureau of Agricultural Economics and is stationed in Washington, D. C.

J. M. Stepp, professor of agricultural economics at Clemson College, has completed a survey of postwar industrial development in four states for the National Planning Association.

Arthur W. Van Dyke has been appointed assistant professor of agricultural economics at the University of Connecticut in the field of extension marketing of fruits and vegetables. Previous to this appointment, he was at Cornell University where he worked with farm labor associations on problems of business management.

Don Swartz has joined the staff of the Dairy Section, Cooperative Research and Service Division, Farm Credit Administration. Before joining the Division, he worked as an economist with the Michigan Milk Producers Association, Detroit, Michigan.

Otis T. Weaver returned to the Cooperative Research and Service Division, Farm Credit Administration in October following several years with the Tennessee Valley Authority and a more recent assignment with the Military Government in Korea as executive secretary, National Economic Board.

O. V. Wells, Chief of the Bureau of Agricultural Economics, has accepted a summer session appointment on the staff of the Department of Agricultural Economics, University of Wisconsin, beginning June 27, 1949. Professor Wells will give two courses—one on "Agricultural Policy" and the other in the general field of research in agricultural economics.

E. C. Young, Dean of the Graduate School at Purdue University, returned to Purdue University February 1 to assume his duties as Dean of the Graduate School, after a year's leave of absence to direct a study of milk marketing for the New York State Commission of Agriculture. Dean Young is commuting, part time, to New York City to complete the study.

The Bureau of Agricultural Economics lost one of its outstanding State statisticians November 18, when Andrew J. Surratt, head of the Federal-State Crop Reporting office at Springfield, Illinois, died in an automobile accident near St. James, Missouri. Mrs. Surratt, who was in the car driven by her husband when it overturned, suffered slight injuries. The two were en route to Oklahoma to spend Thanksgiving with their daughter.

Mr. Surratt, just past 67, was the dean of active State statisticians. He had been with the Department of Agriculture since 1913 and would have retired within 3 years. He first served as agricultural statistician in the Dakotas with headquarters at Aberdeen, S. D., transferring to Illinois in 1922. He was chairman of the Illinois Corn Hog Board of Review, AAA, USDA ('33-'35) and a member of the Federal-State Drought Relief Commission for Illinois in '34 and '36. He was an elder in the Presbyterian church, a Mason, and a member of the American Farm Economics Association, the American Soybean Association, and of the Mid-Day Luncheon Club, Springfield, Illinois.

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No. 1, Part 2

AGRICULTURE IN A STABILIZED ECONOMY*

EDWIN G. NOURSE
Council of Economic Advisers

NEAR the close of 1945 Professor T. W. Schultz presented a study, "Agriculture in an Unstable Economy" under the auspices of the Committee for Economic Development. This study was designed to bring the methods of economic analysis to the shaping of public and private agricultural policy.

Schultz's concern was primarily with the low incomes received by farm families periodically—or even perennially except for the temporarily enhanced demands of wartime. The fickleness of the weather, the recurrence of military conflict, and the fluctuations of business (basically heavy industry) were cited as the three sources of instability against which agriculture must contend. Although Schultz clearly set forth the "stabilization of the industrial-urban economy at high production and employment" as the "first line of defense" for satisfactory farm income, his book was primarily concerned with the second line of defense, or such changes in institutions and practices as would operate to offset the forces of rural instability. On the basis of his diagnosis, he prescribed compensatory payments as a specific remedy though forward pricing to farmers provide a broad base for his total therapy.

It is no part of my present task to analyze the *modus operandi* or the practical efficacy of this remedy in a world which continued to suffer in future the vicissitudes of weather, of war, and of industrial curtailment such as we have experienced in the past. The certainty of weather changes and the uncertainty of avoiding war give sound reasons for us to direct searching attention to both governmental and private means (such as better farm management and coopera-

* A paper given at the Annual Meeting of the American Farm Economic Association, Green Lake, Wisconsin, September 16, 1948.

tive organization) for offsetting the market disturbances that result from surplus and scarcity.

But the third factor of instability is not similarly to be taken for granted or dealt with merely through some scheme of affecting manipulations of market supplies or of private incomes. The country has now undertaken to do something positive about business depression. Only a few months after the appearance of Professor Schultz's book, the Employment Act of 1946 undertook to create within our frame of government such agencies both executive and legislative as would promote a more stable total economy.

The Employment Act of 1946 launches a frontal attack on the problem of stabilizing American industry at a high level of employment and production, that is, promoting sustained use of our resources, natural, human, and financial. Any reasonable degree of success toward reaching that goal would make a substantial contribution toward the stabilization of agriculture by providing a sustained market for farm products. The national legislation under which I have the honor to hold office proposes to deal with this aspect of unsatisfactory rural purchasing power by the fundamental methods of restoring economic health rather than merely easing the pain of economic illness.

This undertaking, however, is not a one-way street. The industrial sector of the economy can suffer unstabilizing jolts from a badly managed or incorrectly directed agriculture quite as truly as agriculture can be rocked by industrial disturbances. Thus, there must be a simultaneous, coordinated adjustment of agriculture and industry, including their commercial, financial, and communication ancillaries, if we are to achieve a practicably stabilized economy. In my title "Agriculture in a Stabilized Economy," I have attempted to suggest the importance for agricultural thinking that this development of a national program of economic stabilization carries. But if my title were to describe properly the points I wish to discuss with my fellow agricultural economists, it should be expanded to read: "Agriculture's Contribution to a Stabilized Economy" or "Agriculture's Responsibility in the Stabilization of the Economy." As agricultural economists, we must do more than explore the question: Can agriculture's problem of low and unstable income be solved, at least in substantial part, through practicable measures for the stabilization of high industrial employment or through monetary and fiscal measures? We are challenged with the corollary question: "How can agriculture be so organized and

farmers so conduct their business affairs that agriculture as a basic industry shall itself make the maximum positive contribution to the stabilization of the economy as a whole?"

The Council and its staff are exploring our task of bringing professional economics to bear on the continuous analysis of causes of instability and the recommendation of public policies that would lead toward high-level stability. This focuses our attention on the nature of the price system (including factor shares) through which, with major reliance on the devices of an open market, a free people can continuously keep themselves at work efficiently as well as diligently up to that point where the various workers prefer leisure to more goods. This brings us face to face with the question whether we, as economists and businessmen, workers, bankers, and farmers in fact understand the nature of the relationships between prices, wages, costs, and profits well enough so that we can make our myriad operative decisions in such a way that they will add up to sustained prosperity or high-level use of resources.

It is very easy for us to talk about "maladjustments" in the system or about "factors of instability," about the "disparity" between movements of economic factors that we conceive to be causally related, or about "the development of imbalance in the economic structure." But when we come right down to it, how much do any of us know as to what constitutes balance, what are the kinds of relationship that are essential to dynamic stability? We are impressed in our Council work with the fact that both economic theory and business practices will require a great deal of re-thinking if we are to make even measurable progress toward the attainment of the purposes set forth in the Employment Act.¹

¹ I am disposed to reiterate in this connection the view I expressed in January 1948:

"Economists of my generation were brought up in the tradition of the 'price-organized society' or 'exchange cooperation,' in a preponderantly *laissez-faire* setting. We have lived—I trust not beyond our time—to experience the realities of a society whose economic life is by no means ordered by mere behavioristic responses to free-running market influences. Perhaps our economic system today cannot be regarded as predominantly characterized by determinations even nominally based on free market prices. Not only may the government, through many of its agencies, set or significantly modify a rate or price, large industrial or mercantile corporations, banker affiliations, cooperative associations, labor unions may also inject similar fixations of exchange ratios into the stream of economic life, leaving the affected parties to adjust their operations to the resultant situations as best they may. Or these administrative agencies—public or private—may decide autocratically to turn whole blocks of given resources into the stream of production or trade at specific places or to withhold them. In this event, the price system must absorb the impact of these centralized determinations of volume as best it can.

"No longer is the economics of individualism adequate to the problems of large

This is hardly the place or time for an extended and detailed discussion of those objectives. Some steps in this direction have been taken in the Annual Reports of the Council of Economic Advisers and in the Economic Reports of the President. My main point is that we still need to do a lot of re-thinking of our economics if we are to set up appropriate and attainable goals for the American economy. The goal of "maximum employment, production, and purchasing power" calls for more than stability as such. It calls for the full and sustained use of our economic resources. It calls for a continuous and increasing flow of goods and services to all our people. It calls for economic progress, not economic stagnation. It calls for prices and incomes that are so adjusted that they will help guide our economy toward a steadily rising standard of living.

In all fairness, I think it can be said that this process of re-thinking began earlier and has been systematized and carried farther in agriculture than in either of the other major sectors of the economy, namely organized labor and what we are pleased to call business, industry, or management. I believe also that agricultural economists are coming to realize more and more the futility of agricultural goals, policies, and programs that are developed in isolation and that are not properly coordinated with the goals, policies, and programs for labor and industry.

Agriculture was the most inherently individualistic major occupation and thus could (even though it used the cooperative association) do relatively little to grapple with its problems through the methods of organization turned to by the business corporation and the labor union. Thus, it jumped over the stage of piecemeal private solutions and came directly to broad issues of economic principle and public policy in relation to the industry as a whole.

and rigid business groups and government participation in business. I think it is not fantastic to suggest that the economic phenomena of corporate, union, and government price administration and large-scale decision of action or of obstruction (including financial controls) move us from the phenomena of the endlessly tossing but perpetually leveling ocean (to use Edgeworth's phrase, ripples and 'viscous waves' upon the surface of "a sluggish sea") to the phenomena of the towering icepack and the abysmal crevasse.

"Confronted by the problems of such a business world, we economists have ranged ourselves in two schools of thought. One school would apply dynamite to the ice jam or even hope to melt the separate blocks back to their pristine fluidity. The other would accept crystallization as an accomplished fact decreed by Nature, they would seek by skillful engineering and with architectural vision to shape and build those blocks—of varying sizes—into a stable and serviceable structure of business."

"Collective Bargaining and the Common Interest," *American Economic Review*, March 1943 (Presidential address, 55th annual meeting of the American Economic Association, Washington, D. C., Jan. 6, 1943)

The agricultural depression of the 20's led farmers to demand that institutional provisions be made to give them economic protection because individual means and private organizations were inadequate. They argued that the economic demoralization of agriculture undermined the prosperity of the whole economy.

When general depression overtook the country in the 30's, public policy accepted the idea of national support devices for agriculture as a safety measure for the whole economy. The fact of the interdependence of agriculture, labor, and business as the three great sectors of the economy was soundly conceived in the demand for "parity"—although the concept of parity as economic equilibrium was only crudely reflected in the parity formula then devised. Even later attempts at reformulation have sought further to corrupt it about as often as they have really been designed to refine or perfect it. We have during the past three decades seen a considerable growth of outspoken and at times rampant agrarianism in this country. But at the same time, there has been a deeper and, let us hope, stronger undertow of thoughtful analysis toward realization of the fundamental integration of problems of agricultural prosperity with those of total prosperity.

Professor Black put the matter with admirable clarity and force on the eve of World War II in his incisive book *Parity, Parity, Parity*. Taking off from the parity concept formulated in the agrarian struggle of the 20's and 30's, he said:

Parity for Agriculture alone is impossible, Parity is a balance concept . . . If Agriculture gets more than its share and tips the scales downward in its favor, then the rest of society must get less than before. . . . Three parities must be considered—Parity for Agriculture, Parity for Labor, and Parity for Capital.

The term Parity was brought into the discussion by Agriculture. But Labor has *thought* parity ever since there have been free men. In this country it has thought it with increasing intensity since the turn of the century. In concrete terms, the issue for Labor has been higher wages, shorter hours, and better working conditions. In more general terms, Labor has been fighting for a *larger share of the REAL income of society* . . .

Capital also has had its years of discomfiture. They have been periodic, with every business recession. The recessions in 1893, 1907, 1914, and 1921 developed into major depressions. But the spokesmen for Capital have never made the mistake of asking for a larger share of the national income. . . . Capital had other ways of looking after its income share, but they did not keep depressions from recurring. The scales still tip steeply against Capital in every recession.

Three Parties though there be, it has remained for Agriculture to make us conscious of it. Labor and Capital fought out their differences in their

own way, leaving Agriculture pretty much a bystander. Now Agriculture has barged into the fight, sparring first with one and then with the other. And the public looks on somewhat in amazement, and somewhat in bewilderment.²

There have, of course, from time to time been proposals of alliance such as the Farmer-Labor movement. That proposal foundered on Labor's sensitivity to high food costs and on the farmer's resentment at effort to unionize farm labor or even at the infiltration of union ideology into the hired man's thinking or because of the competitive pressure of factory wages on farm labor costs. There have also been efforts to emphasize the capitalist alignment of the modern farmer, and schism has arisen between capitalist farming and subsistence farming or agriculture as a "way of life," not a business. But with the declaration of national policy made in the Employment Act of 1946, the way has been opened for approaching the reconciliation of the interests. It now devolves upon us to learn how to compute the common denominator of maximum national production which will give each of the three factors—labor, capitalist industry, and the farmer—maximum real purchasing power.

Business, in its approach to this problem, is disposed to claim that it is the role of management to reconcile the rival claims of labor, capital, and the consumer. Businessmen have expounded a rationale which stresses the importance of company earnings large enough to replace capital equipment as it wears out, to modernize plant in step with advancing technology, and to expand it in anticipation both of population growth and of vigorously rising standards of living. Top business organizations express concern for the welfare of agriculture but are critical of agricultural supports which tend to deprive the consumer and industrial users of the benefit of large crops while they permit the farmer to reap the full benefit of any period of relatively short supply. This is particularly true when market demand is stimulated by foreign aid or other governmental or tax-fed purchases. Business lays great stress on the self-defeating character of wage advances driven through at times when there is no increase in labor productivity—which assumes that wages at whatever time is taken as base were correctly adjusted or in economic balance. Whatever the merits of managements' claim that it sees the economic picture in its entirety, we can hardly be content with unilateral determination of controverted issues. Only if each of the three interest groups is satisfied that it is being recompensed

² Black, John D., *Parity, Parity, Parity*, pp. 1, 2.

in proportion to its productive contribution will it put forth the effort needed to achieve the maximum total.

Labor's attitude toward economic adjustment is not, like capital's, defensive of a favorable position already enjoyed. It is a strategy of aggressive action to better a position regarded as unsatisfactory. Professor Black says "Labor has *thought* parity ever since there have been free men." That takes in a lot of territory. I gravely doubt that the record would bear out this characterization of labor policy over the important organization period of the last sixty years. Mr. Gompers' formula was essentially, "Build up all the group strength we can, and then *get ours now*." The only way I can recognize craft union policy as one of seeking parity of return would be on the ground that labor took it as an axiom that the worker's return was always and everywhere too low for a true economic balance. The craft union school of labor strategy did not direct itself toward making an objective econometric demonstration of the respective amounts of this disparity for the several labor groups. Nor, in my observation, would John L. Lewis or James Cesare Petrillo have any understanding of or patience with such an approach.

Present union policy-making*as a whole, however, has turned to the tools of economic analysis and statistical measurement to relate wage bargaining to such a concept of economically rationalized returns. Frequently they have drawn up economic briefs in support of their claims which certainly justify Black's assertion, if changed to the present tense. Much of organized labor today *is thinking* economic parity. A very capable consultative committee of CIO executives and economists which sits around our Council table periodically has ably explored this approach. It has memorialized us and the President with documents urging the calling of tripartite conferences in which the interrelated adjustments of labor, management, and agriculture should be systematically analyzed, to the end that a body of economic adjustment principles might in due time be evolved.

The labor spokesmen have started from certain conclusions as to the disparity between industrial returns (called "the greatest profits in history") and labor wages. These conclusions may not be universally agreed to even though the unions offer supporting data and analysis. But the point is that they urged that "the President through his Council of Economic Advisers should convene all groups immediately to establish an agreed upon

program which all management, labor, and agriculture will pursue."³ The immediate issue was stated as the halting of current inflation. A second objective was to agree in advance on the principles which should be followed and the devices which should be employed to prevent recession (if and when it comes) from progressing into a vicious downward spiral of mutually destructive liquidation or bringing the economy to a dead center of chronic stagnation far below the productive level of available resources. Third, and most important of all, they put the question "What do we do to build and maintain on a long-term basis a permanent full-employment and full-production economy?"

The Council has by no means brushed off this thoughtfully advanced proposal. Rather have we asked. How many labor representatives can you send who will be prepared objectively to consider and technically to understand the complex issues involved in the functioning of a total economy on a stabilized basis of high production? Will these representatives be willing to stay in session as long as needed to arrive at truly workable solutions, and will they be prepared to make such concessions on behalf of labor as are necessary to get an initial formulation and a progressive method for testing those principles in operation and to make subsequent adjustments as need for them develops? Will these representatives be given necessary powers of action by their constituents, and can they give the other parties reasonable assurances of compliance with the arrangements arrived at?

Our labor friends recognize the seriousness of these obstacles. So do representatives of agriculture and of business with whom also we have discussed the possibility of such a tripartite economic principle and policy conference. In all modesty the Council has had to say on behalf of the economics profession. "We are not yet properly equipped to give the technical guidance which such a conference would need. No one yet has a profound enough knowledge of the infinitely complex system of economic forces and human (largely

³ *Statement on the General Price Situation* by Emil Rieve, Administrative Chairman, CIO Full Employment Committee, Aug. 12, 1947, and similar suggestions in *Statement of the CIO Full Employment Committee to the Council of Economic Advisers*, June 7, 1948.

Only last week a like proposal was advanced by William Green, president of the A.F.L. In his Labor Day address, at Akron, Ohio, he said "The American Federation of Labor calls upon our Government to request business and agriculture to join with organized labor in conferences to protect the economic security of our country. . . . The free enterprise system has proved in the past to be far superior to any other. But free enterprise does not mean anarchy, nor a policy of the devil take the hindmost. It must operate for the benefit of all the people, not only a favored few at the top."

institutionalized group) behavior which determines the functioning of our modern industrial economy to have sure answers."

But quite possibly the best way to move ourselves toward such understanding is to combine the experimental method with our other tools of study such as theoretical and statistical analysis. If, after carefully considered formulation of the issues and marshalling of our respective economic analyses, we of agriculture, of industry and of labor were all to meet in a working assembly charged with the task of synthesizing a comprehensive program of practical adjustment, we might all learn more in the process than from any other available procedure. The real question is whether in the last analysis we have the will to succeed, whether each of the several interests is willing to submit to the self-discipline necessary to hammer out an answer by the methods of science rather than trying to force a differential advantage for itself through the methods of group warfare.

A year ago, Professor Schultz committed himself to the pessimistic conclusion that we do not have such a will to succeed. He said:

"The United States is not prepared to keep its economy at full production. Neither among the people nor from representatives of agriculture, labor, and business has there emerged a conception of full production that is valid. Instead, thus far, for the most part, we have been making politics and not policies to deal with this matter. The conditions necessary to achieve this important objective are not understood. We are blocked by a bundle of mistaken beliefs. We are in conflict as to the more ultimate ends. . . . Each group is prone to define full production to fit its own interest, with a profound indifference to the general welfare. One group's definition can lead only to inflation, another's to deflation; one view could give stagnation, another economic instability.

"Higher support prices for farm products, higher corporate profits for business, and higher wage rates are not the stuff out of which full production is made. The criteria for full production are not to be found in the folklore of any special interest group. We need an objective standard. One that is free from social biases, free from hidden political purposes. We need a standard that can be described, identified and tested. It should not be an instrument of special pleading, of propaganda to beat down labor, or on the other hand to price labor even higher."⁴

I am afraid that as a literal statement, Schultz is right. The United States is not *today* prepared really to *achieve* the stabilization of its economy at a high level of production. But I am un-

⁴ Theodore W. Schultz, "The Economic Challenge that Comes with Full Production," Third National Forum of Agriculture, Labor, and Industry, University of Wyoming, Laramie, July 28, 1947.

willing to admit that this country is not ready to *begin the process* of showing that it has the economic sophistication and the self-discipline to *work out* the private and public adjustments through which this objective can be reasonably well attained under a system of private business enterprise and representative government action.

I do not know whether a national economic conference of the proposed sort will ever be called. But we as economists, if we are to give a good account of our professional stewardship, should be ready if and when it comes. While the active cooperation of businessmen, bankers, workers, farmers, and consumers must be had if suitable goals are to be set up and in due time reached, the economist has very important functions to perform. First, he must work with the technical production experts to determine what patterns of production and consumption are feasible with the resources we have or with the resources we can develop. Second, he must determine what price, income and profit patterns are consistent with each of these patterns of production and consumption. Third, he must gather, analyze, and present any material that will help the public decide what shifts in production and distribution would be beneficial. Fourth, he must rigorously test the soundness of policies and programs that are proposed to bring about these adjustments.

Besides providing the factual and analytical materials on which goals should be set and adjustments based, the profession should supply some well-trained, tough-minded, and fearlessly honest economists to serve on the staffs of business, labor, and agricultural organizations. We should help to broaden the economic education of those who serve as leaders of organizations in all these fields. So far as possible, we should also promote elementary economic education among the rank and file so that they will choose the right kind of leaders and be willing to follow sound leadership when matters come to the issue.

Again let me say that we in agriculture are fortunate in the long growth of popular scientific education through the agricultural colleges, experiment stations, and extension service and through the agricultural high schools and boys and girls clubs. In the past generation remarkable progress has been made toward bringing about a better general understanding of agricultural economics. Labor appears to be on the threshold of a somewhat similar development, and management is expanding educational agencies that range all the way from arrant propaganda to the scholarly but practical research studies and policy statements that emanate

from the C.E.D. Enlargement and improvement of these efforts are needed if economic adjustments of truly stabilizing character are to be achieved.

As for agriculture, in recent years the U. S. Department of Agriculture and the agricultural colleges have had some very interesting and useful experience in setting up goals for agricultural production crop by crop and State by State and in working out programs consistent with these goals. I hope this work will not only continue but will be strengthened and will be coordinated with the development of goals for the rest of the economy.

Two other recent developments seem to me to be in line with the kind of research and educational program I have been discussing. One of these is the work of the Postwar Agricultural Policy Committee of the Association of Land Grant Colleges and Universities. Their studies and the report issued in 1944 included a broad survey of postwar objectives of agriculture in sound functional relation to the whole economy, and proposed policies and programs for reaching them. In the words of its authors it was "prepared with the purpose of advancing the welfare of all of the people of this nation by making constructive suggestions for a sound agricultural policy."⁵

The other development I have in mind is the essay contest conducted by this association in 1945 to bring forward new proposals for programs to support agricultural prices and to stimulate a wide discussion of such proposals. Activities like these are concrete examples of the kinds of study and educational work needed in agriculture. In view of subsequent developments it may be suggested that it would have been more serviceable if the thought of our most able and ingenious economists had at that time been directed not to support measures but to consideration of the problem of what measures could be devised to prevent a rather moderate agricultural shortage from having such profound inflationary consequences as those of the latter half of 1947 and of 1948.

Farmers fortuitously became a major factor in a profound and rather pernicious inflationary sequence. It will not do simply to say they were innocent or passive beneficiaries of the phenomenon so inimical to the health of the economic process as a whole. Did they do anything to lessen the harmful impact on the economy of the adventitious benefits they were receiving or to remove or lower any

⁵ *Report of the Committee on Postwar Agricultural Policy of the Association of Land Grant Colleges and Universities, October 1944, p. 3.*

of the artificial props to their favored position? No. Cotton and wool farmers have been as ready to hold up the country as the most predatory of the trusts or the most ruthless of the unions. The dairy co-ops reputedly spent a large sum to lobby for the retention of legislation designed to keep butter prices high by denying access to a wholesome alternative product. Tobacco growers intervened actively to get parity formulas that permitted selection of a different base period and, later, a choice among three bases so that everyone could get some price enhancement even when tobacco prices were already high.

It may be easier for the agricultural economist—and he no doubt gets a better welcome—when he comes forward with proposals of support than with proposals of restraint or the foregoing of windfall gains. But true economic stabilization requires the dampening of boom influences quite as much as it does the bolstering of a collapse. Presumably if the former is done competently, need for the latter would not arise. If in some measure we fell short of the stabilization service we might have rendered in 1947 or '48, we should be all the more determined to be tough-minded and fearless in dealing with the agricultural adjustment problems of 1949 and 1950.

There will be a grave testing time for agricultural adjustment principles in the years just ahead. Agricultural statesmanship must ease the farm industry down from its wartime stilts. Agricultural economists must show both vigor and objectivity in their thinking if they are to point the way to adjustments that will produce a reasonable level of remuneration for the larger number of men and of acres rather than the highest possible level of return for fewer acres and fewer men; that will promote optimum mechanization in both scale and rate, not mere maximum mechanization and possible overcapitalization, that will effect the kinds of labor-saving that make high general nutrition possible rather than forcing unemployment; and pricing that will keep farm plant in use and preserve farm job opportunities rather than pricing the farmer out of his normal market and accelerate the use of synthetics and other substitute materials.

We need the kind of agricultural policy that will contribute to well rounded national prosperity. The agencies of education in agricultural and national economics must blaze the path to such policies if agriculture is to contribute properly to the stabilization of the economy and on that basis have its own real income stabilized on a high level.

AGRICULTURAL POLICY*

Chairman · O. B. Jesness, University of Minnesota

RUDOLPH K. FROKER
University of Wisconsin

FOR my opening statement on this panel I shall compare briefly the agricultural act of 1948 with the principal recommendations of the committee which reported here a year ago on "Redefinition of Parity Price and Parity Income."

The American Farm Economic Association committee placed its main emphasis upon parity income for farmers as a group rather than parity prices for individual farm commodities. Some may contend that the new act is in complete variance with last year's report. Such is not the case.

The committee made several suggestions for revising parity prices but preferred the income approach over the price and commodity approach. Let me quote a paragraph from that report.

"If the only alternatives were retention of the present parity-price formula or modification of it, we would certainly favor the latter. In such modification we would employ not only a moving base period for determining the relationship among parity prices of the respective agricultural commodities, but also a shifting base period for the parity-price index itself. Its base period would be the most recent normal peacetime period in which national production and employment were at high levels. Together with this change we would favor the inclusion in the index of farm wage rates, weighted exclusively on the basis of expenditures for hired farm labor. Periodic revision should be made of the weights assigned to the various items in the index; the current parity prices of crops should reflect departures in national yield per acre from the average of the preceding ten years."

In the hearing records developed preliminary to enactment of the 1948 legislation there is evidence that some of the sponsors including Senator Aitkin were thinking in terms of both income and prices. By adjusting the support price inversely with the size of the crop the new act seeks to stabilize farm income from year to year for each of the basic commodities. Your committee placed its emphasis upon maintaining the per capita farm income in line with nonfarm incomes.

* Five-minute papers presented at the Annual Meeting of the American Farm Economic Association, Green Lake, Wisconsin, September 13, 1948.

The flexible price support provisions of the new act are probably its most distinctive feature and correct some of the undesirable provisions of the earlier legislation. It is to be noted, however, that adjustments in prices may come slowly under the new act, since the new parity cannot be adjusted downward more than 5 percent per year under the old formula. It may, therefore, be several years before some of the farm commodities are brought into balance.

The new act provides for prices being determined on the free market so long as the prices do not fall below the support level. The committee's proposal called for free market prices regardless of the level. Unless the market is allowed to operate freely throughout the price range, it cannot serve fully the important function of directing consumption and production until they balance and the market is cleared.

The methods by which prices may be supported under the new act include. (1) government purchases; (2) loans and (3) direct payments to farmers. The committee favored direct payments to farmers over the other two methods when used purely for the purpose of enhancing farm prices and farm income. It obviously was not opposed to purchases by the government for specific purposes other than mere price support. In fact, the committee recommended enlargement of nutritional programs such as the school lunch program.

The committee favored graduating the income payments downward as the size of the farm operations rise. In this way it favored the small operator and the family farm. It also favored linking, although not combining, soil conservation and farm income programs. I do not believe there is any such provision in the new act. When the price of a commodity is supported in the market place some very sizable benefits accrue to large operators. Under the present support prices for potatoes the benefits to each of the largest growers run up to several hundred thousand dollars. This situation has become the basis for much public comment.

By supporting prices above competitive levels the new act is likely to lead to production control, to multiple price plans and to continued subsidized exports. The committee sought to avoid these measures by letting prices find their competitive level and making additional payments when necessary, direct to farmers.

The total cost to consumers and the public under the new act will be difficult to determine while the payments under the com-

mittee's proposal would have been out in the open and easily determined. This is an advantage or disadvantage depending on your point of view.

T. K. COWDEN

American Farm Bureau Federation

Five points will be raised:

1. *The importance of having agricultural policies consistent with our international aims*—Peace is the most important problem facing not only the American farmer but also the entire world. Care must be exercised to see that agricultural policies are consistent with international policies. If the United States is to fulfill its world obligations and our citizens to receive proper benefit from world leadership, we will have to trade with other nations. Trade means we must import as well as export. There is a real education program to be done in this field. My respect for the work and responsibilities of the Land-Grant colleges has increased rather than decreased as a result of my experiences during the past five years. A sound international policy cannot be developed unless there is widespread understanding by our citizens of the problems involved.
2. *Adding greater stability to the general price level*—This is one of the most important problems facing our economy. It involves many interrelated and complicated factors. Perhaps the best place to start is the establishment of a joint congressional monetary study commission. The congressional commission should use technical experts. Since any action will likely involve congressional approval, steps should be taken now to develop congressional leadership in this field. Present information indicates that we should have a national monetary commission with responsibility for coordinating the various factors in such a manner as to contribute to greater price stability. This involves taxation, the handling of the national debt, the regulation of credit, the backing for the dollar, exchange rates, and factors influencing the general economic stability of the country. Adding greater stability to the general price level offers greater promise than numerous attempts to stabilize prices of individual commodities.
3. *A pricing program for agriculture*—Whether we like it or not there will be some kind of governmental pricing program for

agricultural products. It remains to be seen whether this program will develop into a governmentally-administered price system or a program which will serve during periods of low agricultural prices. The American farmer, especially the commercial family farmer, has much to gain by the maintenance of a relatively free market which will enable the the productive farmer with the know-how and the skills to advance to the best of his ability. There is a real challenge to operate our economy in such a manner that farmers as well as other citizens will not continually turn to government in in the hope of obtaining price relief.

4. *A program of real conservation is needed*—It appears that the technical knowledge in this field exceeds the development of techniques to obtain the application of conservation practices. Since the government is likely to spend considerable sums of money for various conservation purposes, it is essential that more thought be given to the techniques of getting the job done. This involves soil conservation, flood control, forestry, public land problems, and related fields. It is commonly stated that although the government owns large acreages of forests, 90 percent of our capacity to grow timber is in the hands of private owners. It is apparent that the government cannot conserve all the resources of the nation. If the job is going to be done, it will have to be done by the man on the land.
5. *A program for southern agriculture*—Per capita income in the southeastern United States is the lowest of any area in this country. Serious consideration should be given to a broad-scale approach to increasing the productivity of this area. This involves industrialization, perhaps the development of power, expanded research in agriculture, and many other things. From the standpoint of public policy, the question might well be raised as to why we spend millions of dollars of public money in the West developing new agricultural areas, and pass up the southeastern United States, especially since much of the West has a cold, severe climate in which very few people live, while the Southeast is a thickly populated area where the climate is at least conducive to lower living costs. May it not be in order to consider a positive development program for southeastern United States?

WALTER P. COTTON

North Carolina State College

REMARKS in this five minute paper are directed toward a desirable policy for improving the productivity of human resources in agriculture. The objective naturally directs the emphasis towards those areas which in the past have had the lowest productivity per worker. In the first half of this decade the average income of the lower 40 percent of agricultural workers was only one-sixth of that of the upper 60 percent and only one-seventh of the average earnings of all industrial workers. Is there a formula which will give parity of income to these three groups?

These low income farm families are scattered throughout the Nation but have their greatest concentration in the South. However, irrespective of area of concentration, such a divergence in income and productivity is contrary to the interest of both the Nation and the low-income communities.

The problem is essentially one of an unbalanced man-land ratio. Pace has not been kept with a movement from an agrarian to a more balanced economy with its diversity of productive enterprises and services.

The primary symptom of this maladjustment is underconsumption of housing, clothing, food, health facilities, education, and a host of services. Contributing causes are lack of capital, high birth rates, lack of skills and low levels of learning; and their resultant underemployment, lack of alternative opportunities, immobility, and low incomes.

The problem involves both those people who remain on farms, and their brothers who leave in search of better opportunities. The productivity of one contributes to the food market supply and demand for industrial goods; and the productivity of the other contributes to industrial goods supplies and the demand for farm products.

For the Nation as a whole it is estimated that only one-half of the farm youth is required for replacements on farms. In the South, if the man-land ratio is to be improved, probably less than half are required.

Relief for the pressure of farm population on agricultural resources lies in three directions. These are:

1. More complete utilization of land resources.
2. Employment of a higher percentage of farm people in manufacturing industries, or related services within the area where they now live.
3. Migration of part of the population from the most congested areas to industrial centers in other parts of the Nation.

The latter method has been most popular historically. But considerable progress in the first two fields has been realized in recent years. For example, in North Carolina the proportion of the gainfully employed that were engaged in agriculture dropped from 53.5 percent in 1920 to 33 percent in 1946. In 1946, employment in *manufacturing in North Carolina* was 25 percent greater than in 1939. In addition, the manufacturing industries had become considerably more diversified. For the Southeast as a whole, per capita incomes increased from 51 percent of the national average in 1929 to 67 percent in 1947.

In recent years the Catawba Valley of North Carolina, Upper East Tennessee and much of the Tennessee River Valley have become excellent examples of rural industrial communities, in contrast to centralized industry.

There are a number of ways in which national policy may speed up the process of bringing about a better balance in employment and increasing the productivity of agricultural workers in the South. But in the limited time available attention is devoted to one for which there is a great need and which in the past has had too small a part in national agricultural policy.

There is a crying need for vocational guidance and vocational training in both non-agricultural and agricultural fields in the transformation of these areas from an agrarian to a better balanced economy. Using North Carolina again as an example, 80 percent of the high school graduates and drop-outs have no special preparation for employment. Nearly one-half have never attended high school. About one-half of the rural high schools are without vocational agriculture. Less than 10 percent of all high schools in the state have day trade or diversified occupation training, and these are located largely in urban centers. Out-of-school teen age youths are practically without a training program¹. The production and marketing of human skills is as important as the production and marketing of farm commodities.

Surely increased productivity would result if more workers in

¹ North Carolina Department of Public Instruction

industry, agriculture, and forestry had higher skills. Certainly, employment opportunities would be greater if such skills and training were developed. Better education would lead to the removal of many of the causes of low income.

Our economic system is based of a flow of industries to resources, goods to markets and workers to industries. The value of migrants to the community to which they go depends upon their skill and training. Therefore, the responsibility for, and the fruits from the vocational training of youth falls as much in the sphere of the areas to which they may go as of the areas from which they come.

Adequate vocational guidance and training of the rural youth of any community is as much a responsibility of the state as the of community, and of the Nation as of the state.

Along with vocational training must come industrial development, the development of a complexity of services and their employment opportunities. These may need to be attended by a further development of natural resources in order to attract industries. An increased standard of minimum wages and other social welfare programs also may be necessary.

But first of all, let us pay respect to the ability, dignity and initiative of the individual by giving him an opportunity to train for filling his economic place in society, whether it be in the field of industry, services, or agriculture.

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I SHOULD like to head into this policy discussion at a point where American and Canadian farm policy have some common ground, by which I mean the European Recovery Program.

First, however, because it will provide a useful back-ground, and because the question has been raised specifically by one of the members of the panel, I should like to make a few comments on Canadian wheat policy. The Canadian Government has had through the war and post-war years an explicit policy of maintaining wheat acreage at about pre-war levels. This is sharply in contrast with the expansion policy of the United States—measured in terms of acreage by increasing from 57 million acres in the period 1935–39 to 74 million acres in the crop year just ended. While American wheat exports were abnormally low in the period 1934–38, they have in the past crop year risen to the phenomenal

level of about one-half a billion bushels as wheat or wheat equivalent. The presently proposed International Wheat Agreement indicates clearly that the U.S. will remain a very important exporter of wheat in the next several years. Canadian wheat policy has been criticized on the grounds that Canada had resources with which to expand wheat production to help meet the extremely large world demand of the past four years.

In September 1943 future trading in wheat of the Winnipeg Grain Exchange was suspended. This action, dictated by the Canadian Government, was taken on the grounds that open trading was inconsistent (1) with domestic price control, and (2) with the fact that the government had become the sole exporter of wheat. I am not suggesting that the government in this action was not influenced by some farm organizations which had long advocated the closing of the Winnipeg Exchange. In this connection I might make the observation that, on the whole, Canadian farmers have been more eager than American farmers to avoid pricing the products they produce in a free market.

In 1946 the Canadian government undertook a four year wheat contract with the United Kingdom. This contract provided for the export to the United Kingdom of a large proportion of Canada's exportable wheat at prices varying in accord with conditions which might exist during the years of the contract period. For the 1946 crops the contract price was \$1.55 per bushel basis No. 1 Northern, Fort William; in 1947 the same; and in the present crop year \$2.00 per bushel. Canadian farmers have actually received prices somewhat higher than those indicated, due to the fact that wheat exported to other countries is priced in terms of prevailing world prices.

In the first two years of the contract over 300 million bushels of wheat were sold by Canada at prices approximately \$1.00 less than the corresponding Chicago prices. The extent to which Canadian farmers lost in the operation depends upon the particular assumptions one makes in attempting to assess the effects of the contract. This contribution by Canadian farmers, or rather by the Canadian Government on behalf of Canadian farmers, was made on the grounds that it would aid in securing domestic economic stability and in the recovery of the U.K. The question has frequently been raised whether or not the burden of such contributions should rest on one group of producers as against placing

them on the whole economy which would have resulted had the contributions been made from tax funds.

A Permanent Dollar Shortage?

The European Recovery Program is, in economic terms, a dollar providing program. The question I should like to ask, and a question of major importance to agriculture, is whether or not we are to be faced with a dollar shortage in the years beyond the E.R.P. I shall not analyze this point, but rather indicate that the U.N. Economic Commission for Europe, *The Economist*, (London), and Dean John H. Williams of Harvard University assert with compelling reasons that there are substantial grounds for believing that world trade may be frustrated in the post E.R.P. period by a shortage of dollars.

I ask you to consider what kind of a pattern farm production would take if we are to be faced with a permanent dollar shortage. Certainly Europe would be provided with grounds for a policy of greater self-sufficiency in food, especially in cereals, than would otherwise occur. The U.K. is already adopting this pattern. Secondly, Europe would feel it necessary to secure from non-dollar areas the largest possible quantity of food and fiber. Again the U.K. has already commenced such policies. Should a post E.R.P. dollar shortage occur, world agriculture would be faced with frustration and depressed conditions. These would only be tempered somewhat by the narrowing gap in the race between prospective population and potential food supply.

While this is a gloomy line to be following at a time when we are greatly troubled by inflationary forces, it is, nevertheless our responsibility to show some concern for the long-run. How could American and Canadian policy be shaped to avoid such a dollar shortage as described above? How can the facilities of the World Bank and the International Monetary Fund be employed to help meet such a contingency? Can we conceive of dollar investments sufficiently large to overcome the difficulties envisaged?

Canada is grateful for the E.R.P. She is, if you wish to put it that way, a recipient of E.R.P. aid. The sales by Canada to U.S. for shipment in the E.R.P. program from 5th May to 30th September of this year were 279 million dollars. This sum has gone some distance toward balancing Canada's difficult dollar position.

More than two-thirds of these E.R.P. funds have been spent on the purchases of farm products.

A corollary of the Canadian dollar difficulty is that Canada is not now making grants or loans of any kind toward the realization of European recovery. Many Canadians disagree with this policy. I number myself among this group. The U.S. State Department and the government of the U.K., disagree with this policy. Why does the Canadian government follow this line? This policy of not assisting in present European recovery measures traces to the particular devices which the Canadian government selected in the attack on its dollar shortage problem. That government has had in the past year, and still has alternatives to its present dollar saving program.

O. C. STINE

Bureau of Agricultural Economics

THE subject of national agricultural policy and parity is too broad and the time too short to outline the field or give much attention to definitions and historical developments. I propose to outline only briefly the legislative developments of parity policy outlines and their present status.

The agricultural adjustment act of 1933 marks the first assumption of *national* responsibility for maintaining an economic balance in our national economy. The declaration of emergency in that act reads in part as follows: "That the present acute economic emergency being *in part* the consequence of a severe and increasing disparity between the prices of agricultural and other commodities, which disparity has largely destroyed the purchasing power of farmers for industrial products, has broken down the orderly exchange of commodities and has seriously impaired the agricultural assets supporting the national credit structure, it is hereby declared that these conditions in the basic industry of agriculture have affected transactions in agricultural commodities with a *national* public interest. . . ."

Following this statement it was declared to be the policy of Congress. . . . "(1) To establish and maintain such balance between the production and consumption of agricultural commodities, and such marketing conditions therefor, as will reestablish prices to farmers at a level that will give agricultural commodities a purchasing power with respect to articles that farmers buy,

equivalent to the purchasing power of agricultural commodities in the base period. . . . (2) To approach such equality of purchasing power by gradual correction of the present inequalities therein at as rapid a rate as is deemed feasible in view of the current consumption demand in domestic and foreign markets. . . . (3) To protect the consumers' interest by readjusting farm production at such level as will not increase the percentage of the consumers' retail expenditures for agricultural commodities above the percentage which was returned to the farmer in the prewar period."

The Soil Conservation and Domestic Allotment Act of 1936 amending the act of 1933, further developed the policy statement in the following language. "... this act shall also include, (1) preservation and improvement of soil fertility; (2) promotion of the economic use and conservation of land. (3) diminution of exploitation and wasteful and unscientific use of national soil resources. . . ."

The consumers' interest was reaffirmed in the statement: "That in carrying out the purposes of this section due regard shall be given to the maintenance of a continuous and stable supply of agricultural commodities adequate to meet consumer demand at prices fair to both producers and consumers".

In the acts of 1936 and 1938 we find recognition of income and purchasing power of farmers, in relation to the earnings of those engaged in nonfarm occupations, as an objective and a measure of parity. The provisions for the use of price relations as a parity standard in 1933, the addition of purchasing power of income in 1936, the revision of the definition of income parity in 1938 were progressive steps in developing measures of parity. It has been recognized that it is goods and services rather than dollars that count, however, in our economy money is necessary to command goods and services. It is a matter of exchange relations in the market to obtain equivalent opportunities for the farm operator and his family in terms of living conditions and opportunities for the future.

The "agricultural act of 1948" improves the parity measures by providing for. (1) adjusting price parities to take into account recent trends in supplying and demand conditions among the several farm products, and (2) support measures related to current and prospective demand and gross income. In this act parity income is defined as the gross income necessary to provide the farm operator

and his family with a standard of living equivalent to that afforded persons dependent upon other occupations. The development of this parity standard requires additional statistical data and analysis, the establishment of comparable measures of standards of living in relation to the time and distribution of income. It suggests concern with educational and recreational opportunities as well as with food, clothing and health for farm families.

We are not forgetting the land and the consumer. The natural resources are to be only maintained but also improved, and the needs of consumers are to be met. Parity for agriculture broadly interpreted today means the maintenance of agricultural resources sufficient to meet the agricultural needs of a growing population with a rising standard of living in this country, to support foreign consumers of such products to the extent that they are dependent upon us and return to the farm worker and his family for this service income sufficient to enable him to keep up with his neighbors.

DISCUSSION¹

The discussion began by being centered around the proposition of agricultural support price. Income parity for farmers as a group rather than parity prices for individual agricultural commodities has been supported by many agricultural economists. Recent legislation provides flexible price supports and corrects some of the undesirable features of the old legislation, although adjustments in prices may be slow in coming since supports under the new parity formula cannot be adjusted downward more than 5 percent per year. Farmers must decide whether they want to have a free market or support prices, they cannot have both. Price supports are needed in times of low prices, but not otherwise. If we are to have price supports in times of low prices, how about price ceilings in times of high prices?

In the development of a system of free enterprise, it is important that the relationship between national and international commitments should be taken into consideration. It would seem at present that there is very little possibility of legislating parity incomes for farmers. In using a system of direct payments from the treasury, each individual farmer's income would depend upon his own cash receipts, the larger his volume of production, the larger his total income. Farmers as a general rule do not like direct payments from the treasury. This fact might be a major deterrent for this type of program.

The present program of support legislation is likely to lead to production control, multiple price plans and to continued subsidized exports. These

¹ Summary prepared by Panel Secretary, Frederick R. Taylor, University of Minnesota.

all might be avoided by allowing prices to seek their natural level and making direct payments to farmers when necessary.

The question of rehabilitating the underprivileged areas of the country was next discussed. A national policy must be set up to bring about a better balance in employment between areas and an increase in the productivity of the agricultural workers in these areas. The productivity of these areas can be increased by improved technology, increased industrialization, development of power projects, increased educational opportunities for the people of these areas, and expanded research towards adapting improved varieties and the better use of resources in these areas. The problem is essentially one of an unbalanced man-land ratio and improvement here might come from a more complete utilization of land resources, an increased employment of the people of these areas in decentralized manufacturing industries and the movement of some of the inhabitants of these areas to more industrialized sectors of the economy.

A national agricultural policy which would encourage farmers to lower their costs of production was next discussed. A state and national policy to encourage education, research and extension work along these lines is needed. Production quotas as now set up tend to retain inefficiency on our farms. Payments which are made contingent upon farmers having met certain efficiencies, increased productivity and skills, would improve the program. Payments linked to soil conservation, and the development of techniques to improve soil conservation practices, flood and erosion control might aid in the development of this program.

A discussion followed relating to the prospects of high prices being capitalized into higher land values and higher prices. Support prices tend to keep prices above the free or natural market level and therefore do tend to be capitalized. In working out a long-range agricultural policy, we need to develop a satisfactory general policy. We must think in terms of all sections of the economy first, and then relate policies for specific sectors of the economy to this general policy. It would seem clear that all policies must fit into the world situation. Care must be exercised to see that agricultural policies are consistent with international policies as well as those of other sectors of the domestic economy. We need to think in terms of basic guide-posts of policy, guiding elements in a long-range agricultural policy. In the past, we have laid out broad lines of policy for agriculture, but have not done this for the domestic economy or world as a whole. We have had special policy legislation, but not specific policy formation. Stress must be placed upon the significant differences between policy proposals and congressional action. Short-run problems can be anticipated by proper long-run policy proposals.

Goals of a good agricultural policy would include: (1) adequate resource use, (2) continuity (3) stability, (4) consistent with general and international policies, and (5) regard for the interest of farm people and the consumer. We must imply or infer a general policy as a setting for agricultural policy. Guideposts include: (1) maintenance of reasonable incomes, (2) improved efficiencies, (3) soil conservation, (4) better use of human resources, and (5) the maximum allocation of resources. The question arises

as to whether a policy that is shaped on expediency can rise above that level? If we start with the development of an agricultural policy, rather than that of a general policy, we are in danger of starting in the wrong place.

The next part of the discussion centered on the inefficiency of agriculture in the South. The question was raised as to how a shift can be made from small ineffective units, where the south has too much of human and not enough of other resources. The general opinion was that the shift cannot be made painlessly, and that the jobs will have to be done to a great extent by the south itself. A broad over-all approach will have to be taken where a review is made, area by area, of available resources, human and natural, and the possibilities of shift and change from present conditions. It may be necessary for the government to spend considerable sums of money to aid in the reallocation of resources, increased productivity, and the conversion to more economical units of production.

There are two general principles underlying American economic policy that must always be kept in mind. These are: (1) maximum freedom for the individual, and (2) a reasonable degree of economic stability and economic opportunity.

The discussion next centered on consumer interest on agricultural policy. The consensus of opinion seemed to be that consumers as a group are not very well sold on present agricultural policy. An agricultural policy needs not only to be sound but also needs the understanding and support of consumers to be effective. Most of the particular problems facing consumers today are those which come from short-run effects. The consumer wants to be assured food and clothing from agriculture at reasonable prices. The fact must be emphasized to the public that they must pay a price such as will maintain production in the long-run. This country must have a stabilized level of production in order to be economically sound. Consumers need to know why and how surpluses arise and ways and means of dealing with them. The Treasury and the Federal Reserve Board must recognize at all times the effects of monetary and fiscal policy on economic stability. It is apparent that some over-all agency is needed in government that will coordinate responsibilities of government agencies regarding price stability.

THE AGRICULTURAL ACT OF 1948*

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PAST history suggests caution in predicting the consequences of new legislation. However, in a democratic society a new legislative act may be considered a definite accomplishment if it improves the laws it supplants. Progress in legislation is likely to be slow. Perhaps the most serious handicap to desirable agricultural legislation is the very size of this country and its diverse sectional agricultural interests. Congressional viewpoints pertaining to agriculture are colored not only by these conditions but also by the proportion of urban and rural interests and the amount of state taxes paid to the national treasury as well as federal payments back to the individual state.

In seeking public interest in better legislation it is easy to criticize the lack of intelligent interest in pending legislation among the electorate. The public is likely to be confused in part by the tendency to attack one farm problem at a time without considering its relationship to broad national agricultural policy geared to a balanced national economy. An integration and understanding of the implications of new or proposed legislation seem imperative to sound policy attainment. Agricultural interests without exception have not been sufficiently aware of the necessity of keeping agriculture sold to the consuming public. With less than 20 percent of our population engaged in agriculture it becomes continually more imperative that agricultural programs be developed with due regard to the interest of consumers and that consumer education be an important part of any agricultural program. The consumer, without realizing it, is the chief beneficiary of technical developments in the field of agriculture. Time prevents a further elaboration of this point or of the basis for special agricultural legislation.

These are a few thoughts I would like you to keep in mind as we turn to a brief analysis of the content and intent of the Agricultural Act of 1948 together with some explanation of Congressional background pertaining to it.

The Agricultural Act of 1948 passed in the last hours of the 80th

* Paper given at the American Farm Economic Association Annual Meeting, Green Lake, Wisconsin, September 15, 1948.

Congress is limited mainly to a price support program. It is essentially a compromise between two different price support philosophies represented in the separate Senate and House bills. As finally passed, it provides for a flexible farm price support program adjusted to supply to become effective in 1950. That the long-range or flexible farm price support and the entire Senate Bill 2318 passed the Senate by a vote of 79 to 3 is significant in pointing to future legislation. The House bill was a stopgap measure passed by a small total House vote providing that most of the farm price support measures now in existence should continue for two years without adjustment of price supports to supply. The bill finally agreed to by the Senate and House conferees combines the two bills. It provides that the price support of basic farm commodities—corn, wheat, cotton, rice, and peanuts—will continue at 90 percent of parity until the 1949 crop is marketed or until June 30, 1950, thus shortening the period of high price supports contained in the original House bill. On July 1, 1950, the long-time flexible farm price support program will go into effect for these commodities.

The wartime Steagall Amendment provided for price supports for the so-called Steagall commodities at 90 percent of parity as a wartime measure designed to encourage increased production of commodities in greatest need for a period of two years following the declared end of the war. It was not anticipated by most people that the provisions of the amendment would continue under normal peacetime conditions. The Senate bill assumed since the war is over that a long-time price support program is desirable. However, the compromise with the House bill provides, in addition to the basic commodities, price supports for milk and its products, hogs, chickens, and eggs at 90 percent of parity until December 31, 1949, and for other Steagall commodities at not less than 60 or more than 90 percent of parity at the discretion of the Secretary of Agriculture until December 31, 1949. Tobacco according to a Senate Amendment is supported permanently at 90 percent of parity if marketing quotas are in effect. One may expect tobacco growers to keep marketing quotas in effect. The 1949 crop of wool will be supported at 90 percent of parity, but beyond that time at 60–90 percent of parity with the objective of encouraging an annual production of 360 million pounds of shorn wool.

Wool was given special consideration in order to maintain the sheep industry at a level adequate to meet a substantial part of

our needs without relying upon wool imports. The world demand for wool at the present time has forced its price to a high level. The support for wool will probably not be effective until the world consumption of wool falls much below the present level. The domestic production of shorn wool has now fallen below 300 million pounds to the lowest point in 47 years. Placing the goal of domestic wool production at 360 million pounds of shorn wool instead of 300 million was the result of a Senate floor amendment. The increase in the wool production goal may prove unwise, but the amendment was not opposed by the Senate committee partly in order to avoid extended floor debate at a late hour in the session. The 360 million goal is considerably below maximum production of the past when our population was less than at present.

The long-time features of the bill, which becomes effective in 1950, provide that a normal supply of corn, wheat, cotton, rice, and peanuts will be supported at 75 percent of parity price. Normal supply is defined as the past year's domestic consumption, expected current year's exports, and an additional percentage of the crop representing the supply in the normal channels of trade. As the supply increases by two percent of normal, the price support drops one percent of parity until it reaches 60 percent of parity with a supply of 130 percent of normal production. Also as the supply falls to 70 percent of normal the price support rises to 90 percent of parity. This flexible price support feature of the Act is the most distinctive feature of the new legislation and is intended to correct the present uneconomic program of supporting price without reference to supply.

The thought back of this long-time flexible price support policy is that the schedule provided, assuming the schedule might become effective with either large or small supplies, will assure a farmer a larger total income for a large production than for a small production but the price per unit of product will be less. This is in the interest of consumers who want abundant production since it encourages farmers to produce a large output. Further, a definite floor under the prices of these commodities will have a stabilizing influence on the market price. A severe break in the price of a farm commodity at harvest is due in part to farmers' hastening to sell their products before prices sink lower. Providing an actual floor under prices but at a given moderate level may have the effect of increasing the harvest-time price of grain if supplies are unusu-

ally high. Further, when prices of farm products are permitted to sink below 60 percent of parity as in the early thirties, the entire national economy is disrupted, because farmers, as well as others, cease to be normal purchasers of other goods and services. Low prices for farm products also contribute to unemployment.

The Act provides bases for farmers to vote on production control when the prices of basic commodities fall to 66 percent or less of parity for three successive months or when supply of a commodity exceeds the normal supply by more than 20 percent. If farmers vote for quotas, the support price shall be 20 percent above the market price at the beginning of the marketing year but shall not exceed 90 percent of parity, except in cases of national interest determined by the Secretary for the purpose of obtaining adequate supplies. If controls are voted down, support prices will be placed at 50 percent of parity. These regulations may be questioned and time may be required to test whether or not they are well founded. It was the hope of those responsible for drafting the Senate bill that controls will not need to be resorted to except for real emergencies, thus reducing control measures to a minimum.

When the long-range price support program goes into effect, a new parity price formula also becomes effective. This is based upon the relationship between the prices of farm products sold and of commodities bought by farmers in the period 1909-14 as in the present parity prices. It was decided that a new base period should not be established until a longer and a more stable period following the war had elapsed. The difference between the old and new parity formulas is simply this—the old parity formula maintains the relationship between prices of individual farm commodities in 1909-14 unless some other base period has been selected. This 1909-14 period does not reflect present-day price relationships because of changes in methods of production, the improvement in crop yields, changes in relative demands, and many other factors. The new parity formula uses the relationship of the price of an individual farm product to the average price of all farm products for the ten preceding years. This keeps the parity prices of individual farm products adjusted to changing demand and price relationships. It is an automatic formula which each year adds the new year and drops the oldest of ten preceding years as a basis for determining the parity price of individual farm products.

A good reason for establishing recent current price relationships

as a basis for parity is that about two-thirds of the approximately 155 farm products for which a parity price is figured have been given a new base period by the Secretary of Agriculture under his discretionary powers. Strangely some of those who have argued for new bases must have been quite clever in presenting their cases as some of the revised base periods seem peculiarly favorable to some products. A well-chosen common base period should relieve some suspicions

In drafting Senate Bill 2318 it was recognized that areas of production of certain products had been somewhat influenced by price supports, that is, that price supports rather than underlying supply and demand conditions have influenced farmers in their production plans. Also it was recognized that the change from the old to the new parity would considerably change the relative parity prices of some products. In general, parity prices of grain would be reduced from 10 to 20 percent while those of livestock would be increased. However, the average for all farm products under the old and new parity prices formulas is essentially the same, the difference amounting to less than one percent. It was further recognized that there would be considerable opposition to a quick reduction in the parity price of important products. Senate Bill 2318, therefore, provided that when the new parity price is lower than the old parity price, the adjustment to the new parity price would take place at a rate no greater than five percent of the old parity price in any year. This was done to prevent such a sharp readjustment in price support as to impose undue hardships upon some producers. However, if the new parity price is above the old parity price, the adjustment to the new parity price will take place immediately since it was considered that such a change would be in the interest of the most economic production through encouraging the production of commodities in greatest market demand. This adjustment from old to new parity prices helped to enlist the support of certain Congressmen from areas producing products whose parity price would be materially lower under the new formula. Some Senators from areas where parity prices of the principal farm products will be affected adversely recognized that the new parity formula provided for a gradual adjustment of production in the interest of the most economic use of resources.

The price support bill further provides for the support of prices of other than the five basic commodities and tobacco at prices up

to 90 percent of parity with such funds as may be made available to the Secretary of Agriculture. The so-called Section 32 funds which represent 30 percent of our import duties are made available for farm price support operations. These funds amounted to 135 million dollars in 1947-48, of this amount 75 million dollars are now assigned to the School Lunch Program. This still leaves about 60 million dollars for supporting various commodities. In addition, the Commodity Credit Corporation is permitted to support prices of storable farm products if they are handled without too great a carrying charge. Section 32 funds will help support the prices of perishable products and, as a matter of fact, represent a larger fund than was used in any year during the war period if subsidy payments to hold down the prices of food products to consumers are excluded. The postwar experience with potatoes is another matter.

The 1948 Agricultural Act represents two radically different price support philosophies. The Senate Bill 2318, known as the Aiken Bill, regarded the Steagall price support measures as an emergency measure designed to stimulate production of products in short supply and to help ease the world food situation, and recognized further that the emergency food situation was drawing to an end. On the other hand, one can surmise that the House stopgap measure providing high price supports for the basic commodities and most of the Steagall commodities for a two-year period was designed at least in the belief of some Congressmen that at the end of the two-year period, when a Congressional election would be pending, high price supports could again be extended either permanently or for another two-year period. Some proponents apparently expected that if this were done, it would place farm products under constant controls. This is a significant difference in point of view from that of the men who drafted Senate Bill 2318, which provides flexible price supports based upon variations in supply with sufficient flexibility in supports to prevent ruinously low farm prices and also to encourage adjustments in production in line with demand. On the other hand, the House bill provided a high level of price supports which would afford little incentive for farmers to consider demand when planning their production. The planning apparently would be left to federal authorities.

In the meantime the extension of high price supports for even 18 months may require the taxpayer to make good on a price sup-

port bill that may make the costs of potato price support look like "small potatoes." Thus the Aiken Bill philosophy is one of retaining freedom on the part of the farmer to adjust his production to meet demand in accordance with the free enterprise tradition of our country. This would place a premium upon farmer education and adequate economic outlook information.

Recognizing the course of legislative action and that 18 months of high price supports may accumulate burdensome supplies of certain farm products, any major failure of the Agricultural Act of 1948 to provide for workable long-time price support consistent with consumer interest may be charged in part to the Agricultural Committee of the House or their conferees who steadfastly refused to take the Senate Bill 2318 to the House floor for vote. There is reason to feel that except for this refusal, Senate Bill 2318 might have been passed by the House. At least this was the thought of some important members of the House who had accepted the House bill as a stopgap measure to assure a greater measure of support for agricultural prices than the 1938 Agricultural Act which would, of course, have become effective at the expiration of the Steagall Amendment without further legislative action. Attention may well be called to the fact that the Senate defeated the House bill by a 2 to 1 vote even though some of its supporters believed because it was so near the end of the Congressional session that it afforded the only means of securing any price legislative action in the 80th session of Congress. The prompt Senate vote of 79 to 3 for the entire Senate Bill 2318 after defeating the House bill indicated stronger support than anyone had anticipated.

At this point it is of interest to note that the press and the Agricultural Services in Washington had quite consistently predicted no agricultural price legislation at the recent session of Congress. Furthermore, after the passage of the Agricultural Act the press predicted revised legislation in the next session of Congress providing for higher supports than in the law as passed. We see now, however, how quickly opinion can change. At the moment the feeling seems to be growing that the basic long-range price support principles will remain fixed as contained in the Agricultural Act of 1948. This statement is made mainly because the major farmer organizations have supported the long-range price support program. Any new legislation pertaining to price supports will lower rather than raise them for the 1949 crop year. Should any House

member be so unwise as to attempt an upward revision of the long-range price support schedule, some of the commodities receiving preferred treatment may receive further consideration. The favored treatment of tobacco, which crept into the bill in the late hours of Congress by a vote of 41 to 39, was mainly because some Senators had already gone to Philadelphia to help write the Republican platform. Furthermore, some people have questioned the favored treatment of peanuts, which represent less than one percent of the national agricultural income, and of rice with only 10,000 producers. Some Senators refrained from expressing themselves on some of these favored minor products only from expediency in order to avoid long debate in the closing hours of Congress and of getting the more desirable features of the bill enacted. Possibly the most likely revision of the price support features of the Act will be to provide comparable long-range price supports for additional products.

Since it was the apparent intent of this evening's program to point toward future legislation, certain comments pertaining to the relationship between the two Houses of Congress seem in order. The 79 to 3 support of the Senate Bill 2318 and the unanimous support of the bill by vote of the Subcommittee and full Committee on Agriculture and Forestry all indicate the trend of Senate thinking relative to future agricultural legislation. The guiding principles or essentials of a long-range agricultural policy likely to direct legislative action in the Senate are set forth in Senate Report 885. These received enough consideration so that one may believe that they will not be lost sight of by the Senate Committee on Agriculture and Forestry. Also, it is likely that the policy statement in Senate Bill 2318 which was dropped in conference is now well fixed in the minds of the aggressive agricultural leadership of the Senate. One need not draw heavily upon his imagination to recognize that if the House had accepted Titles 3 and 4 of the Senate Bill 2318 dealing with farm price supports without insisting upon a year to 18 months of high supports, the Senate might have been willing to make some concession in the future relative to the reorganization of federal agencies and conservation legislation originating in the House. However, it would appear to a layman that following the insistence of the House for high price supports that the Senate will have no compunction in attempting to have at least equal weight with the House in framing future farm legis-

lation. Possibly the Senate will receive more executive support than the House based upon the past session's accomplishments. It is idle to predict just what might happen with regard to any attempt to lower the high farm prices supports prior to January 1 or July 1, 1950. Certainly at the time the legislation was passed the high level of 1948 production of corn, wheat, and cotton as now estimated was not foreseen. The House Agricultural Committee is likely to find itself confronted with dissatisfied farmers and consumers with the price of farm products supported not too successfully at heavy public expense and on a basis not approved by the public. Difficulties are likely to arise with these three basic commodities and with potatoes. There would appear to be little need of high price supports for most of the Steagall commodities during the next year or longer because the supply of animal products in particular cannot be increased materially in a short space of time. The reduction in livestock production from the wartime peak is not surprising when one considers the relative price supports provided by the Steagall Amendment and the scarcity of farm labor and feed. The evidence is increasing that desirable changes in production are most likely to occur when prices clearly reflect the relative supply and demand for farm products.

In conclusion, there are a few claims that can justly be made for the long-range price support provisions of the new agricultural legislation:

1. The flexible price support feature of the Act should make supply and demand the major guides to farm production.
2. The revision of parity prices will tend to give encouragement to the production of livestock, which will aid in disposing of burdensome grain supplies and indirectly encourage better human nutrition.
3. The minimum support level for basic commodities and other commodities within the limit of the available funds should prevent ruinously low prices.
4. The judicious use of Section 32 funds, made available for price support operations, should materially aid in stabilizing prices of other than the basic commodities and should encourage better human food habits.
5. Assuming the price support program becomes operative at both high and low support levels, it assures farmers a larger return for a large production of basic commodities than for a smaller

production, and this helps assure consumers an abundant production.

6. When other means fail to keep production within bounds it provides for production and marketing quotas if farmers want them.

7. The 50 percent of parity price support if farmers vote against controls avoids coercing farmers into accepting controls as would be done if all supports were withdrawn when farmers vote against controls.

8. Finally the Act leaves even the level of price supports to the discretion of the Secretary of Agriculture, but a wise Secretary would not depart from the price supports provided in the Act except in real emergencies.

FOOD SUPPLY PROBLEMS

Chairman Sherman E. Johnson, Bureau of Agricultural Economics

WORLD POPULATION TRENDS*

CONRAD TAEUBER AND IRENE B. TAEUBER

VIEWING with alarm is almost as characteristic of demography as of the "dismal science" of economics, for each generation tends to project the rates of population change that then exist into the indefinite future and to foresee dire consequences therefrom. With Malthus' famed Essay on Population there began a century and a quarter of demographic pessimism, even though he wrote at the beginning of an era that disproved his gloomy forebodings for the Western cultural area in which he lived. In the recent interwar years a new pessimism developed, for improved statistics and more powerful analytical tools revealed that current population increase was illusory and that population decline was imminent in the Western world. Population projections for Europe and the Soviet Union, published by the League of Nations in 1943, traced through to 1970 the effect of a continuation of the trends toward decline in fertility and mortality that had characterized the interwar period. These projections indicated that, even in the absence of any losses from World War II, Europe excluding the U.S.S.R. would reach its maximum population by 1960, and would then enter a period of slow decline, with a reduction of about 1% between 1965 and 1970. The decrease would come primarily in Northwestern and Central Europe which would grow slightly between 1940 and 1950 and by 1970 would have declined 4 % below the 1940 levels. Southern and Eastern Europe would continue to grow, though soon these countries too would follow the pattern of decline that seemed so obviously present in the remainder of Europe. In the U.S. a careful set of estimates seemed to indicate the indigenous population growth would come to an end by the end of the twentieth century, perhaps as early as 1970. A number of European countries developed population policies to avert the threatened declines. In some countries militarism dictated the drive to maintain numbers, while in others

* Paper given at the Annual Meeting of the American Farm Economic Association, Green Lake, Wis., September 13, 1948

economic motives predominated. This was the period when Keynesian economics united with population predictions to justify the maintenance of increasing populations. In other quarters the questionings of the future were based on the belief that cultures themselves could not hope to survive if the people who were their carriers failed to survive biologically. Pro-natalist population policies and programs were developed in countries with widely divergent political orientation, but in all there was deep scepticism as to whether any trend as deep as that toward population decline could be arrested, let alone reversed.

Thus by the end of the first quarter of the twentieth century the Western world appeared to have resolved the dilemma which Malthus had posed at the end of the eighteenth century, though in doing so it had created problems equally grave. Food resources had increased more rapidly than population, thanks in part to improved production techniques, to increase in the available area, to an ever growing commerce with other parts of the world, and in part to a decline of rates of population growth.

Concern with the prospects of population decline would seem strange indeed to most of the world's peoples, could they comprehend the arguments. While Europe's growth was slowing, the large populations of Asia, the natives of Africa, and the peoples of South America, were increasing rapidly. The world's population problem was illustrated dramatically in the reports of the 1931 and 1941 censuses of India, which indicated that in a single decade its population increase alone amounted to more than the total population of the United Kingdom.

World War II, great catastrophe that it was, did not reduce the world's population. Battle casualties were high in many countries. In some the disruptions of war increased civilian mortality, and China and India suffered famines. The victims of genocide numbered in the millions. Forced population transfers, large scale movements of refugees, and the extension of the battle front to include civilians added still further to war's toll. The total human cost of World War II, though large, cannot yet be estimated with even approximate accuracy. It is possible, however, to compile the official estimates of nations as to their own populations at comparable time periods before and after World War II. Such a compilation, based on the years 1936 and 1947, reveals that the world's population increased nearly two hundred million in the eleven

years that included World War II and its aftermath of want and dislocation (Table 1). Half the reported increase is in Asia. The rates of increase for Central and South America are high, some 24 percent, while Africa, Oceania and North America are reported to have increased by about 14 percent. In much of Europe, as in the Western world in general, war losses were mitigated by the relative maintenance of birth rates during the war and the extraordinary spurts in fertility in the postwar years. Europe's net gain for the eleven year period was four percent. Official estimates for the present boundaries of the U.S.S.R. are not available, but the information that can be assembled indicates that some increase probably occurred there also

TABLE 1 WORLD POPULATION: PROVISIONAL ESTIMATES
FOR 1936 AND 1947
(Populations in millions)

Area	1936	1947	Percentage Increase ¹
Asia (excl postwar area of USSR)	1,130	1,236	9
Europe (excl postwar area of USSR)	371	384	4
North America ²	139	157	13
Latin America	123	153	24
Oceania	10	12	15
Africa	161	184	14
<i>World Total</i> (incl all areas) ³	2,120	2,320	9

¹ Percentages computed before rounding.

² Excluding Central America

³ Estimates contain an approximate allowance for the population of the postwar area of the USSR

Note Estimates are based mainly on data furnished by the Statistical Office of the United Nations.

The Trend of World Population

Population increases have been a regular feature of the modern period. In the pre-modern era population growth had been generally irregular. Normal death rates were high, and the population surpluses of good years were periodically wiped out by famine, epidemic, and war. But gradually as economies expanded and statistics developed, the fact of a generally upward trend of the world's population became indisputable, although the date of the beginning of the increase and its magnitude remain debatable. The most widely accepted estimates of the trends in world population from 1650 to the present are presented in Table 2. They indicate

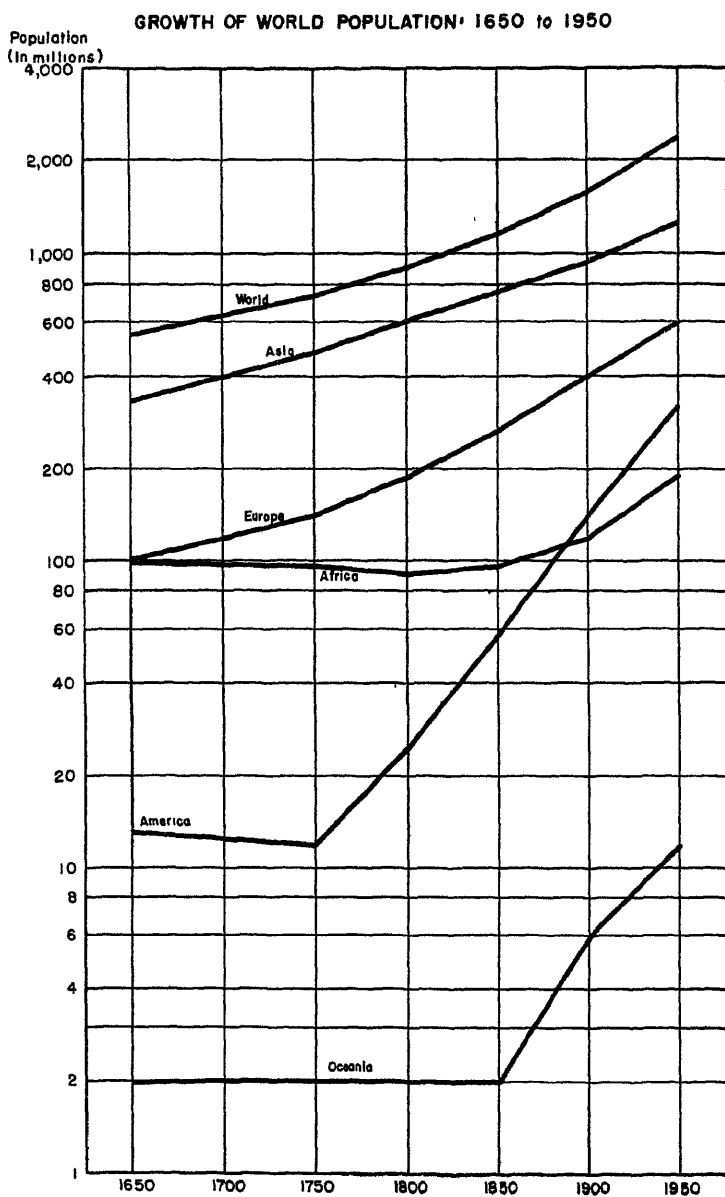


FIG. 1

that the population of the world has increased approximately four-fold in the last three centuries, from 545 million in 1650 to 2,400 million in 1950. Population doubled in the two hundred years from 1650 to 1850, doubled again in the century between 1850 and 1950.

Practically all parts of the world participated in the population increase of the modern period. The most rapid rate of increase is that of the Americas, due to the coincidence of heavy immigration and high rates of natural increase. The increase for Europe is one of the striking phenomena of the period. During these three centuries Europe not only increased its own population six times but also supplied the bulk of the migrants to the Americas and Oceania. Asia more than trebled in numbers to reach 1.3 billion people by 1950.

A simple projection of the rates of increase of the world or the continents into the future would be most fallacious, for as Table 2 shows clearly, the rates of change of the world and its areas have been changing over time.

TABLE 2 WORLD POPULATION GROWTH 1650 TO 1950
(Population in millions)

Area	1650	1750	1800	1850	1900	1950
Africa	100	95	90	95	120	194
America	13	12	25	59	144	324
Asia	330	479	602	749	937	1,270
Europe	100	140	187	266	401	600*
Oceania	2	2	2	2	6	12
TOTAL	545	728	906	1,171	1,608	2,400

* Including the Asiatic part of the USSR (population about 20 million in 1897, about 40 million in 1939)

Source: Estimates for 1650 to 1900 from A. M. Carr-Saunders, *World Population—Past Growth and Present Trends* (Clarendon Press, Oxford 1936) figure 8, p. 42. Estimates for 1950 are based mainly on data furnished by the Statistical Office of the United Nations.

Analysis of the dynamics of change in the various areas and time periods is clearly needed. The factors at work may be illustrated by two contrasting situations: that of the Western world, consisting primarily of Europe and Europeans overseas, where population growth has slowed so much that declines may occur in the near future, and that of the rice areas of Asia, where continued or even increasing rates of natural increase in already densely peopled areas offer a challenge to human engineering so great that many regard it as insoluble.

The Western World

The modern growth patterns of the Western peoples is the resultant of a number of historical developments. The early results of the agricultural and industrial revolutions were decreases in mortality. The large family pattern which had been an essential element in group survival in the subsistence agrarian economies of the ancient and medieval worlds was not immediately affected. Later the changing pattern of working and living in urban industrialized areas, and the growing realization of the fact of mortality control, led to changing individual and group values. Agricultural innovations in the old world combined with the opening up of the large resources of the new world to provide the food supplies that supported continued increases in population. Industrial innovations brought increases in production and provided employment for a population that would have been redundant in the agriculture of the period. Sanitary and medical advances brought under control the diseases that had previously produced high levels of infant and adult mortality. In short, the whole process of modernization in the western world brought rising levels of living and new controls over mortality.

Fertility was much less responsive to the new patterns of development. Gradually, however, new individual and group values developed in response to the changed conditions of working and living in industrialized and urban areas. The small family pattern became not only the ideal but also a goal realized by an increasing proportion of the population. Birth rates fell, first and most rapidly in the cities, later in the surrounding rural areas. The modern increases in population were a function of the time lag between the control of mortality and the control of fertility.

The control of mortality is achievable through increased and regularized food supplies, improved knowledge and application of the principles of health and nutrition, and sanitary and medical programs designed to control disease. Moreover, the limitation of mortality fits in with the major values of virtually all cultures. Death is generally abhorrent to the individual, as to the group, though there are widespread differences in the degree to which this is true. Techniques and activities that are intended to prevent death and to prolong human life have generally triumphed with relative ease over beliefs and practices that they challenged. Furthermore, some of the major advances require relatively little

active participation by the individual. The application of DDT to large areas that were previously infested by insects or using large machines to clear the brush that harbors the tsetse fly require little more than acquiescence of the people affected. Stringent quarantine regulations to prevent the spread of cholera and plague do not require active participation of large segment of the population. Even immunization requires only a small amount of activity by most of the individuals affected. And to a large extent the individuals who resist such activities can still be the beneficiaries of the fact that the community as a whole sanctions them and participates in them. Religious sanctions generally are on the side of mortality control; on the whole, the great religions of the world have obliged their adherents to practice cleanliness and sanitation. The control of fertility, unlike that of mortality, involves deep transformation of human values and relatively complete reorientations of the role of women and the structure of the family. The conditions which tend to create a favorable psychological and moral climate to family limitations are varied. They include such factors as a growing awareness of the potentialities for economic improvement and a desire for such improvement, a realization that control of mortality, especially of infant and child mortality can be achieved; the disruption of older family patterns that accompanies industrial and urban developments; education, especially the education of women, and the growing tensions between the standards of living (representing the aspirations of people) and the levels of living (representing the actual achievements).

The means by which such reduction occurs are not identical in all cultures. They include an increase in the age at which women are married, especially a reduction in the proportion of teen age girls who marry; an increase in the employment of women outside the home; a high ratio of celibacy; and the spacing of births through a variety of techniques, some of which are generally accepted as "natural."

In the Western world, Ireland offers an illustration of family limitations within a cultural setting that is opposed to most techniques to limit fertility. In Ireland, where the fertility of married couples is relatively high, the rate of natural increase in the last 70 years has been relatively low. This is due in large measure to delayed marriage; in 1941, three fifths of the women 25-29 years old were single, and even among women 45 years old and over one

fourth had never married. Despite the late average age at marriage the illegitimacy rate is very low. The result is that this largely rural country has birth rates that are consistent with those of other countries in northern and western Europe

The Rice Areas of Asia

The problem of achieving a new balance of deaths and births that shall secure efficient human reproduction without an overproduction that threatens to negate economic progress is at once more and less difficult in the East than it was earlier in the West.

The large family pattern is deeply rooted in the agrarian rice countries of Asia.¹ Permanent rice agriculture within a given region requires the continuing cooperation of the generations in a stable pattern of relationships. The strong familial social structure which has such high group survival value in creating continuity and stability is also essential to individual survival. The cultivation of rice by hand techniques has heavy seasonal requirements for labor, and these can be met within the traditional social structure only by members of family groups. The population of a village or a region may be too large for the available resources in terms of western standards, but the individual couple without either the help of a larger family group or the labor of their children is in a hopeless economic situation. Here familial and group patterns throughout the area are oriented toward the reproduction of the population. Traditional behavior, the identity of past, present and future as an eternal and unchanging process, the repudiation of the deviant, the abhorrence of change, these are the psychological characteristics that have accompanied the familial social structure and in conjunction with it, have facilitated survival in the rice deltas for hundreds or even thousands of years.

In a period of high mortality, high levels of fertility were essential to the survival of the group. Cultural changes, such as those involved in industrialization and urbanization create a climate favorable to positive steps toward reduction of traditional fertility levels, as the rapid decline of fertility in an industrializing Japan has so clearly indicated. In much of the western world individual measures to control fertility run counter to religious and

¹ Irene B. Tauber in "Migration and the Population Potential of Monsoon Asia." Milbank Memorial Fund, *Postwar Problems of Migration*, pp. 8-11, and in "Trends of Population in Non-Soviet Asia," *Social Science* 21 (4). 306-309, October, 1946

traditional values and may even meet with formal prohibition. There is no reason to believe that the Muslim, the Buddhist, or the Confucian religions would impose prohibitions on the use of contraceptives as such, but the areas where they are prevalent are generally agrarian areas with strong familistic traditions. In many of these areas a woman's position in the family and in the community is rated by the number of sons she has. To be childless is a disgrace. Moreover, in these areas there are economic and other limitations to the utilization of conventional contraceptive devices. How quickly such values yield to considerations of personal health and well-being of mothers or to other criteria for establishing a woman's position in her community is not easily predicted. But although infanticide is no longer widely practiced, methods for inducing abortion are found in virtually all cultures. Moreover, the resort to techniques, such as prolonged breast feeding of infants, which are believed to reduce fertility, is so common in all parts of the world as to suggest that other means would also be applied if they become readily available. What might happen to birth rates if a simple, inexpensive and effective contraceptive were to be placed within the reach of the world's large agrarian populations can only be guessed at the present time. In most high fertility areas, there already are some social groups which effectively control their fertility.

Growth Potential of Regions

A description of the growth of the world's population by continents and a contrast of two types of areas, the technologically advanced and urbanized West, the backward and rural rice areas of Asia does not adequately portray the wide variations in demographic characteristics of the countries of the world. Actually, the world's peoples may be regarded as occupying a continuum from the relative population stagnation of uncontrolled fertility and high mortality to the population decline that ensues when births are inadequate to maintain numbers even under maximum conditions of controlled mortality.

One fifth of the world's population lives in areas in which the shift from high mortality and high fertility to low mortality and low fertility is largely completed. Despite large wartime and postwar increases in fertility in some of these countries, the control of fertility is firmly established in the value systems of these people.

In fact, the recent increases in fertility reflect the extent to which controlled fertility responds to economic and social changes. Relative stability in numbers during the latter half of the twentieth century appears the most likely prospect though there may be some actual declines. These are the economically advanced industrial and urbanized nations, including all Europe except the extreme east and south, the United States, Canada, Australia, New Zealand, and the white population of South Africa.

Another fifth of the world's population lives in areas which are well advanced in the demographic transition from high to low fertility but appear likely to continue to increase their number at relatively rapid rates in the next generation or two. These areas include the U.S.S.R., Japan, Eastern and Southern Europe and parts of Latin America. Wartime population losses may temporarily lead to measures to stimulate or retard the rate of its decline, but the long time trends toward lowered fertility are likely to be continued.

Three fifths of the world's population lives in areas where famines and epidemics, chronic malnutrition, and debilitating diseases are major forces in controlling population numbers. The people of these areas generally have high levels of fertility, high levels of mortality and therefore a potential rate of population growth which is very high. As these areas achieve greater political stability, improve their agriculture, develop industry, and secure minimum standards of epidemic control and famine relief, mortality levels will probably be reduced. These areas include most of Asia, except Japan; Africa except South Africa, and parts of Latin America.

The Prospects

Today the world's population is increasing at approximately one percent per year. It may be slightly more; it may be considerably less. Many of the statistics, especially those for areas which appear to be growing rapidly, are open to considerable doubt. As improvements are made in the completeness and adequacy of a statistical series, differences between current and earlier levels are easily exaggerated. This can and does affect many of the population statistics that are currently in use. However, caveats on the interpretation of numbers that are put forward by countries as intelligent could not alter the fundamental fact that the increase of the world's population is continuing and sizeable. Moreover, the three fifths of the areas in which fertility control has not yet been widely adopted

is making rapid strides in the direction of taking one of the major steps in mortality control, namely the control of infectious diseases. To what extent there will also be an increase of political stability, thus favoring agricultural and economic development, remains to be seen.

Projections of the future populations of Asia, Africa or parts of Latin America is not possible on the basis of demographic history alone, nor on the basis of the theoretical rates of growth. Neither the analogy of the experience of the industrialized west or of an industrializing Japan are any reliable guide to the future of these regions. In the industrialized west the transition from high mortality and high fertility to low mortality and low fertility required approximately 300 years; Japan carried through a similar process of industrialization and urbanization that should terminate the period of growth in less than a century and half. But in Asia, very large numbers would be added if mortality falls as rapidly as it has in other areas and the process of the diffusion of the small-family pattern from the city to the countryside proceeds as slowly as it has in other areas. In the case of China, for example, it has been estimated that if the declines in mortality and fertility were to duplicate those in Japan between 1870 and 1940, the Chinese population would reach one billion by the year 2000.

Food supply is obviously one of the major factors in current levels of mortality, and in the prospects for rapid extension of mortality control. In terms of the prewar situation the relationship was quite clear.² Half the world's total population then lived in countries which had available less than 2250 calories per person per day at the retail level, and over ninety percent of these people lived under conditions that produced crude death rates of 30 per thousand or above; at least three times as high as the 1947 rate in the United States. The exceptional ten percent of this group are accounted for either by the fact of better balanced nutrition in spite of lower calories values or through the extension of modern health and sanitation programs imposed from the outside, as in Formosa, Korea, Philippines and Puerto Rico. At the other extreme, so far as food is concerned, is that less than one eighth of the world's population for whom food available at the retail level, if evenly distributed, would have provided 3000 calories or more,

² "Food, Income and Mortality," *Population Index* 13 (2) 96-103, April, 1947

per person per day. In all those countries but one, the death rates were below 15. Between the upper eighth and the lower half, there is a wide range of conditions both of nutrition and of mortality. Here too there is some freedom of decision, in the sense that at a given food level and health, social and educational policies may be adopted to control mortality if the people so wish. This group also includes a wide diversity of economic conditions, ranging from those still largely dependent on subsistence agriculture to the semi-industrial and industrialized countries.

Two major elements in the western European transition from high mortality and high fertility to low mortality and low fertility are not likely to be repeated as the similar demographic development takes place in other parts of the world. The one is the large scale emigration to unoccupied areas—then the Americas and Oceania—which came at a time when population was growing rapidly due to the more rapid reduction in death rates than in birth rates. The other is the expansion of the resources base through exploration and colonial development. Today it is difficult to visualize a situation in which large surplus areas could produce and ship enough foodstuffs to fill the gap in the needs of the densely populated deficit countries. Increasingly feeding the native population in exporting countries constitutes a first claim on available supplies.

These areas can be counted on insofar as the application of scientific methods provides a far greater output than has hitherto been available. Then they might provide a surplus for export over and above satisfying the needs of improved living levels of the native workers. That is the assumption underlying some of the current large scale development programs in Africa and Latin America.

Changes in the "state of the arts" are obviously a major factor in any consideration of the relation of population and resources. To project demographic calamity on the basis of present population trends assuming that the "state of the arts" remains static is to overlook the history of the last three hundred years. Neither can projections safely be based on the easy optimism of the interwar decades in which it was assumed that fears of over-population and the resultant disaster would be proven wrong within a short period of time by some immutable "progress of the arts."

The limits on the world's supply of good soil and water must be reckoned as a hard fact. But there are social facts which are equally real. And one of the major social facts is that no responsible govern-

ment will voluntarily reduce its population numbers. Prime Minister Nehru of India at the opening of the recent meeting of the Economic Commission for Asia and the Far East expressed the situation in the following words. "A great deal has been said about the population of India and how it overwhelms us and we cannot solve any problem at all till this Indian population is checked or decimated. I have no desire for the population of India to go on increasing. I am all in favor of the population being checked, but I think there is a grave misapprehension when so much stress is laid on this population of India and every evil that India has is supposed to flow from this excess of population. I entirely disagree with that "

Whether the motivation is national pride, the basic desire for national survival, or a desire for manpower to fill potential military needs, voluntary decline of a nation's population does not seem likely. It is almost an inevitability that any nation which is faced with decline will take drastic steps to correct the situation. Moreover, governments will continue to be concerned with finding the resources needed to supply their peoples with basic necessities.

There appears to be little possibility for minimum living within agriculture for the increased population that would result in Asia and Africa from the introduction of the agricultural improvements necessary to adequate nutrition and other elements of living. There must be rapid transfer of people from agricultural to non-agricultural employment. If industrialization occurs and if population growth follows the patterns of areas that have undergone such a transition, fertility will fall as urbanization and its correlated habits of living and thinking are accepted by increasing numbers. These processes are almost certain to occur, but the real demographic need in Asia is to devise ways by which the diffusion of the small family pattern among the peasants may be quickened.

The problem is not alone agricultural, susceptible to solutions within the framework of agriculture. Land resources everywhere are limited, and population pressure on the land is itself one of the major depressants of agricultural productivity. Rural over-population means rural underemployment and inefficiency. Human abilities stagnate during a large part of the year and the rewards for human labor fall far short of what they might be. Unless some way is found of reducing the number of people trying to gain a livelihood from an underdeveloped agriculture, the way to achieving desirable levels of production and nutrition may be barred.

The future population growth of any area is inextricably bound up with its economic and social resources and characteristics and the rates at which they change. To neglect any element in that complex of factors would lead to errors in projections into the future, and yield results that are too "optimistic" or too "pessimistic" as the case may be.

The increase in political self-consciousness of some of the rapidly growing population groups means that among their claims will be an urgent one to secure the maximum possible results from the opportunities which modern science and technology have to offer. Developing the opportunities that lie ahead calls for rapid large-scale developments of agriculture, industry and trade, and educational and other services, and requires large investments of capital and technical skills. This new situation, if it eventuates, may so quicken social change as to reduce drastically the length of the period in which the gage between declining mortality and a still high fertility produces rapid population growth. Half measures and efforts at amelioration are not enough. They are likely to serve in the future, as so often in the past, only to increase the numbers of the poverty stricken and ignorant. Demographic catastrophe is not necessarily the outcome of the forces now at work, but it may be the result if the problems are not faced and attached squarely and realistically.

FOOD PRODUCTION POTENTIALITIES AND PROBLEMS*

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FOOD for everyone might not insure peace. People long for other things, some good and some bad. So we cannot be sure. But we can be reasonably sure of the opposite. Without sufficient food for the population of the world peace is uncertain, indeed unlikely. No group nor region can expect security while others dread the very approach of another day of hunger.

Can the people of the world feed themselves? The question has many facets. First, is there enough good soil on which to raise the food? Or have we reached the limit in area, or in productivity per acre, or in both? Even if theoretical answers to these questions are favorable, could the materials and skills of modern technology be developed in the right places? Would farmers become virtually slaves in the attempt? Are the economic and political obstacles insurmountable anyway?

These questions are too broad and too complicated to be answered precisely with the data and experience available. Yet we must try to approach answers—to reach some first approximations, else we shall be unable to set even ideal goals or to measure our own ability to achieve them.

Just now I want to discuss primarily the physical and biological aspects of the production problem. In those terms alone, could we feed the world?

First, let us take a general view of the world's land supply. A large part of the land area of the world cannot be cultivated: Around 11% has everlasting snow and ice, some 4% is tundra; about 16% is in the high mountains; and another 17% is desert or semi-desert.¹ These inhospitable landscapes make up nearly one-half of the land area of the world. Yet even these lands are not unimportant agriculturally. Many spots of desert and semi-desert are irrigated with water collected from the high mountains. Besides, semi-deserts and mountains furnish grazing of significance.

* A paper given at the Annual Meeting of the American Farm Economic Association, Green Lake, Wisconsin September, 13, 1948.

¹ L. I. Prassolov, *Soil Types in the Agriculture of Different Countries*, Pedology (Moscow) 69-76, No. 2, 1946.

Nor is the other one half of the world's land all good soil, not by any means. Some areas are too sandy, too stony, too salty, too hilly, or too wet for cultivation. We cannot add up precisely how much is suitable for several reasons. First of all, detailed soil maps are available for only a small part of it. Indeed, we cannot say that we even yet have entirely reliable sample surveys of the great areas of tropical soils. Secondly, the use of land for agriculture depends on the state of the agricultural arts and these, in turn, depend upon the transportation and industrial facilities of the same region. Above all, any estimate must be based, consciously or unconsciously, on some economic assumptions. It is physically possible to grow crops almost anywhere. Dykes may be built, water may be piped long distances; stones can be removed, mountainsides may be terraced. On the other hand, all use of land for crops requires at least some work and materials. So even if we had complete data and had all the soils of the world arranged in some descending scale of productivity according to response to management, a line above which we should regard them as arable and below which we should call them non-arable would move with changing economic conditions.

Now something less than 10% of the total land area of the world is cultivated. This separation between cultivated and non-cultivated land is even a little vague and equally reliable estimates vary widely. We may move by gradual stages from very intensive cultivation under glass and in gardens, through general farming to extensive farming with fallow, and almost imperceptibly to the nearly wild grassland, savanna, or forest.

In the temperate regions of the world the better soils are nearly all occupied, of course, not all of them. We could expand considerably here in the United States. But the areas of poor soil now used, which are not sufficiently responsive for minimum standards of farm income, partly offset the potential unused areas.

But north of the temperate region, the cool-temperate Podzol region, only about 1% of the soil is cultivated.² The great areas of these soils are in the Northern Hemisphere—in northern Eurasia and northern North America. Although they make up some 9% of the land area of the world, only an exceedingly small part is cultivated. If we assume, on the basis of experience in Scandinavia and

² For more detail on the origin of these estimates see Robert M. Salter, "World Soil and Fertilizer Resources in Relation to Food Needs," *Science* p. 533-105, 1947.

elsewhere, that only 10% of these might be brought into cultivation, we should have 300,000,000 acres of new arable land. At least when first cultivated, these soils would not be so fertile as those of the temperate region but experience has demonstrated that they can be developed for dairying and for potatoes and other vegetables.

Of far greater importance are the great areas of tropical soils in Africa, South America, Central America, southeastern Asia, and the Pacific Islands. The most important areas of tropical soil now in use for crops lie in southeastern Asia, India, and some of the Pacific Islands. In the southern part of the United States excellent use is made of soils in a warm-temperate humid climate that are somewhat related to those of the tropics. Here and there in both Africa and South America tropical soils are in use but the great resources of tropical soils in these continents are hardly more than touched. If only 20% of the unused tropical soils in the Americas and Africa alone were brought into cultivation somewhere around 900,000,000 acres of arable land might be added to the total. To these potential areas, it is conservative to add another 100,000,000 acres of tropical soil in the great islands like New Guinea, Madagascar, and Borneo.

We may get some notion of the potential productivity of this billion acres of tropical land from experience in the Philippines. An estimate based on that experience would be on the conservative side and would not take account of the great potential increase in efficiency of production that would result from the application in the tropics of modern science, comparable to what has occurred in the temperate regions over the past 100 years. The experience of Finland may serve as a guide to the potentialities of the Podzols. Of course, some classes of products could be increased far more than others, but generally the additional production from those lands would permit us to more than meet most items in the world food needs for 1960 as estimated by the Food and Agriculture Organization of the United Nations, although a few would be short.

This is a lot of land—1,300,000,000 acres. Probably the estimate is either too low or too high. That will depend a great deal on economic conditions when a more accurate check is possible. But I must emphasize that these are “difficult” acres. Very little new soil is simply waiting for the plow. Most of it requires clearing. Most of it is off our present routes in the interior of continents or away from good harbors. Roads, electric power, medical facilities, and

local industry must go along with agricultural settlement. All these soils will need careful management. Many acres will need terraces, levees, partial drainage, or supplemental irrigation. A large part will require lime and fertilizer from the very start. It will take more than "free enterprise" in the breast and a plow in the covered wagon to settle these acres. But planned settlement can be successful.

But do we need all this new land? Besides the new land what can we do with what is already under the plow? Careful estimates made cooperatively by the Department of Agriculture and the Land-Grant colleges indicate that it would be entirely practicable to increase agricultural production in the United States by about 20% on most items and higher than that on several, under economic conditions of nearly full employment. Considering the relative state of the agricultural arts in the various countries of the temperate region, at least equivalent percentage increases are possible in the rest of them—possible from a physical and biological standpoint, assuming an economic system in which farmers may operate efficiently. Thus without the new soil, the food needs of the world could be met for cereals, roots and tubers, and sugar. But some new soil, or further increases in yields beyond those assumed, would be needed to supply a bit more fats and oils, and much more pulses and nuts, fruits and vegetables, meat and milk.

These two together—the potential new land and the increases demonstrably possible on land now being farmed—could give us food significantly beyond that needed for the estimated world population of 1960.

Such estimates are very optimistic in one sense and probably still too low in another. They indicate what *could* be done with present knowledge if the political and economic barriers to effective soil use were somehow removed. At the moment, this "if" may seem to call for miracles of education and statemanship that few expect.

Yet even these estimates take no account of entirely new technology. They merely assume a general acceptance of existing technology to the same extent already used on many farms and in many communities. Yet we know that the efficiency of farm production has been increasing at an accelerated rate for many years.

In the temperate regions, especially in Western Europe and the United States, people have taken more or less for granted a steady increase in agricultural efficiency resulting from modern science.

Did you ever stop to think what would happen if all the people left the United States for 50 years? When they came back how many of our cultivated plants and domestic animals do you suppose they would find? Very few indeed. Most of the superior strains would be gone. With luck, they should find a few specimens here and there from which scientists could begin a breeding program all over again—a program that would take years even with modern techniques. That is, our agriculture has been built up to a high level far above that of the natural environment.

In Europe the effect of science began to be felt in agricultural production in the eighteenth century. Efficiency steadily rose during the nineteenth century, and even up to the present time, except as interrupted by the terrible wars of the twentieth century. In Europe, these increases are even clear in the yield records, to say nothing of input-output ratios.

In the United States yields did not rise markedly, except for a few items, until fairly recent years. There are several reasons for this. First of all, land was plentiful and labor was relatively expensive. Alert farm managers were, and are now, concerned as much with reducing inputs as with increasing outputs. A large part of the improvements was designed to reduce labor even at some sacrifice of total output. Then during the latter part of the nineteenth century and the beginning of the twentieth century, when agricultural science was developing rapidly, we were bringing into use millions and millions of acres of new land in the sub-humid and semi-arid regions where yields are normally low. Thus increasing yields on the well-managed land of the humid regions were offset by the lower normal yields in the semi-arid regions. Further, many of our plant breeding programs were concerned with increasing the areas for important crops rather than increasing the yields of those crops in a fixed area. Take corn for example. See how varieties have been developed for areas that formerly grew little or no corn. Now our farmers have many more choices than they did 50 years ago. But despite these strong influences there have been significant increases in average yields of several of the major crops in the most recent years.

When we look at the matter in terms of efficiency, however, the situation is more clear.³ Between 1800 and 1940 the number of man-

³ See M. R. Cooper, G. T. Barton, and A. P. Brodell, *Progress of Farm Mechanization* U.S.D.A. Misc. Pub. 630 Washington 1947.

hours required to produce 100 bushels of wheat dropped from 373 to 47. The comparable figures for corn are 344 to 83, and we know of the great improvements since 1940. The man-hours for a bale of cotton dropped from 601 to 191 between 1800 and 1940, and we know that they are dropping more rapidly now. According to recent estimates, one farm worker supported about $4\frac{1}{2}$ other people in 1820. And 1820 is not the beginning point by any means, agriculture was much more efficient in 1820 than in 1700. While by 1930 the figure was about 11, by 1940 it was 11.3, and in 1945 it had reached 14.5.

In other words, modern science has not only increased our efficiency but is doing so now at an accelerated rate. Will it not continue? Certainly. And how about the tropics which hasn't even yet a soil science of its own, let alone technology. In fact, there exists now no general research institute in the tropics dedicated to research in fundamental soil science. There is no reason at all to suggest that present results in the tropics, or in the far north for that matter, with technology imported from the temperate regions, are even partially indicative of the future. Soils in the tropics are so different from those in the temperate regions that technology can be transferred only to a limited extent.

We in America take our efficient agriculture for granted, at least that one-third of it which is efficient. We have failed to appreciate fully the direct effects of science and technology. But the indirect effects of technology, through the parallel rise of industry, are even less commonly appreciated. Without industry one cannot expect highly efficient farms. The only exceptions are in the few highly developed areas that are closely bound to an industrial base, like Hawaii, or like Java before the war.

Efficient farming involves machinery, fertilizers, insecticides, fencing, medicines and similar supplies, and often huge dams for irrigation, flood control, and electric power. These are essential for production to say nothing of the living needs of country people.

That needs for these things exist in agricultural communities of subsistence farmers is generally known. But do we know exactly what machines, what fertilizers, and what plant varieties to recommend? We do not, not unless the necessary research has been done on the precise soils or very similar soils elsewhere. Transfers of technology can be made from one area of soil to another area of like soil, but only imperfectly to a different soil. Fundamental soil

science is, of course, universal. But in the applied phases, as we come closer and closer to the actual practices used by farmers, the greater is the difference among unlike soils. Nor can we yet boast of a symmetrical fundamental soil science, not until we have far more research outside of the temperate regions.

Still we do know a lot about soils and how they can be managed for optimum production. Even if we could predict the management requirements of all the thousands of soils in the world for efficient use, what then? In new or backward countries the materials for modern farming can be supplied partly through trade. But aside from trade barriers and political difficulties, two things block much progress along that line. First, a poorly developed agricultural country has difficulty in selling enough, or in getting credits enough, for importing what is really necessary in efficient farming systems. Second, what of the extra rural people—people left over as a community goes from subsistence to efficient farming? The country must either have great resources of new soils for rapid settlement and agricultural expansion or have other new employment for these people.

Thus it seems that no matter where we tackle the problem of backward agricultural areas, we soon run into this intimate relationship between agriculture and industry. Where I have seen backward areas from the Yukon to the Congo, and across Asia, these two must develop together. Industry needs food and raw materials; farmers need industrial products. High levels of health and education are essential for efficiency in both. In countries where people die young, efficiency is bound to be low. The percentage of a man's life when he is able to work is just too small. And he must have a job to work at with enough tools and enough acres.

To accomplish this expansion of industry is much more easily said than done, and done in a way that will benefit the workers and farmers rather than exploit them for outside interests.

Should we be able to see suddenly, tomorrow, efficient agriculture throughout the world, the pattern would be very different from place to place. It would be generally known—not known by just a few—that practices good in one place can be ruinous in others. It would be known that those practices that build up soil productivity to an efficient level, and maintain it there, also give the most efficient production over a long period. Erosive lands would be under a protective cover—not only a protective cover but also a productive cover.

This is a distinction that many of our emotional conservationists fail to make. Of course, we agree with them that we need a protective cover on the soil, but farmers must make a living—we hope a much better living than they have had. Thus the protective cover must be a more productive cover than the one before. This means full utilization of all our knowledge of fertilizers, tillage machinery, drought-resistant and disease-resistant varieties, adapted breeds of livestock, and similar practices. Proper rotations of crops for example, are more important in soil maintenance than the simple mechanical devices for immediate water control.

Farm organizations and community patterns, as well as the individual practices, will vary enormously among the great soil regions. Then, too, what people have to do because of the soil somewhat affects their social customs and ideas, just as their ideas influence their practices and organizations.

Such an ideal world of an efficient agriculture would have plenty of variety in living ways as well as in technology. Uniformity would be impossible; but such differences rather than leading to war, would provide interest and stimulation.

Even a fellow like myself needs to admit that such an ideal world is a long way off. The real world is still more varied. Even on the same kinds of soil, people have approached optimum efficiency at different rates. Some communities may begin with a pattern of ideas and social customs in which technology is quickly accepted. Others have a different pattern and some painful adjustments will be needed along the line. So to the variations of geography must be added those of history.

Can we have an efficient agriculture to meet the food needs of the world? Insofar as he can answer, the soil scientist must give an emphatic "yes." As far as resources and technical knowledge are concerned the upper limit is somewhere above the present food needs of the world, probably a long way above. How far we cannot say. The cultural developments that would accompany the development of these resources might be associated with declining birth rates, but, of course, this is a question for population experts. And these reckonings take no account of the real likelihood that science may soon know how to make at least simple foods, like common sugar, synthetically.

How can all of this be brought about? No one can set down a detailed plan. When the answer is found, it will be seen to be made up of many answers because so many things need doing at once.

Effort toward the goal of abundant food must not prevent or hinder the reaching of other important goals nor should the other values of mankind be destroyed. We must beware of slogans. Food production must be efficient so that farmers have good incomes and can live well—all farmers everywhere. Near the farms must be efficient industries. Above all, if the new world is to be worth working for and living in, the liberties and opportunities of individual men and women must expand.

(1) The people in each community—a country or a distinct area within a country—must learn to help themselves, not by simple neglect, but through whatever programs or devices that need to be used. Improvements that people follow blindly without understanding can lead to short-time spectacular results. But collapse, or tyranny, or both, are likely unless individual responsibility keeps pace with both understanding and need. The slow way of helping people develop their own skill and understanding is, I believe, the fastest way to lasting accomplishment. Many roads lead to tyranny and one must always suspect the quick pictures of “before and after.”⁴

(2) Education is essential. Nearly everyone seems to advocate it; yet progress is painfully slow. Maybe it is said too easily; certainly, we expect too much from too little. Millions neither read nor understand the common European languages. Americans expect too much uniformity. Of course men hold certain eternal verities in common, but people have different ways of thinking and different ways of doing things. Some of these differences are necessary; others are mere matters of taste. We need to learn better how to help other people achieve a better life of their own without wanting to change them.

(3) Exchanges of knowledge between countries can go a long way, *provided*, and only provided, that full account is taken of conditions from place to place. Some industrial processes, like nitrogen fixation, can be used over a very wide range of places. Most soil management practices are specific in their adaptability. That is, we need to use narrowly defined groups of soil types as a basis for many exchanges of agricultural technology; for others we may use broadly defined groups.

Then too, one technology often depends upon another, until we

⁴ Many sources may be cited but none makes the point more clearly than *Christ stopped at Eboli* by Carlos Levi. Translated from the Italian by Frenaye, Frances. New York 1947. (Penguin edition, 1948).

find ourselves dealing with a complex pattern of inter-dependent resource uses. Programs for the solution of this kind of problem we have lately come to know in America as the "TVA idea." This idea will have an increasingly wide application as technology advances.

(4) The need for freer trade is obvious. The whole apparatus of international exchange, credit, and finance is vital to the efficient use of resources and to the necessary import of tools and materials by people beginning to improve their farming and to develop their industry. But to buy they must sell in a fair market. Trade is so important that without fair trade, I fail to see how the goals can be reached. But trade alone is no panacea; there must be a great deal besides.

(5) Above all, I should emphasize scientific research, not just applied science or technology, but fundamental research. Possibly I over-emphasize science. If I do (and I do not admit for a moment that this is so) I may be excused because fundamental science has been so badly neglected in discussion of this problem relative to technology, trade, and education. Then too, it is among the virtues of fundamental science that men find greatest agreement. The language of science is universal. And it is from fundamental science that technology and invention arise.

Only a little agricultural technology can be transferred from Europe and America to the tropics but the principles of scientific theory can be transferred. The great need in the tropics now is for fundamental research. No first-class institution for such research exists today. Technology appropriate to the tropics must arise on the basis of fundamental research within the tropics.

A new agricultural research program for Alaska is just beginning. The Soviet Union had begun work in the Arctic sometime ago.

In the newly developing countries, rather than simply having many highly specialized experimental stations, the need is for general research institutes with good scholars in all the principal fields associated together as in a great university. Through helping start such institutes can America and Europe give a real impetus to the rise of civilization in the tropics, and at the only possible level,—the level of fundamental science where transfers can be made between regions and cultures.

These suggestions are general, and the results lie far ahead. I should like to make some suggestions of things that could be done

immediately, right now, in addition to the program for fundamental research which should not be delayed another day.

(1) Expansion of fertilizer manufacture and use would have a large immediate effect on crop production. For soils reasonably similar to those where fertilizer is now used effectively, good recommendations and yield predictions are available. On other soils results would be less certain but many economically good practices can be recommended today. Industrial plants for the manufacture of fertilizers *could* be built in fertilizer-producing countries immediately. Some factories could be built in other countries needing fertilizer. Of course, the transportation facilities within some countries would not permit getting fertilizer into all parts for some time. But additional millions of tons of food could be had from increases through the use of fertilizers, fertilizers that would cost less than the food would be worth.

(2) Wide distribution can be made of seeds and planting stocks of proved superior kinds and varieties of crops outstanding for disease resistance, drought resistance, and high yield. Enough is known about soil classification on a world basis to make it possible to go far in this direction even though a perfect job cannot be done without more soil mapping. To a less but still important extent superior strains of livestock can be spread rapidly, especially through artificial insemination.

(3) Programs for irrigation in promising areas could get underway at once. The necessary soil surveys and engineering surveys may go on concurrently. Fortunately, some work is already underway. Enough knowledge is available to isolate areas of potentially arable soils in rapid reconnaissance surveys and to follow these with detailed soil maps of the land to be irrigated as a basis for planning drainage, leveling, irrigation ditches, and farming systems. Some likely areas are too far from transportation for immediate development. Emphasis can be given right now to those which can be reached conveniently.

(4) Similarly, some of the great unrealized potentialities for hydroelectric power could be developed soon. Such developments are an essential part of any real agricultural improvement in the tropics.

(5) Diseases and insects that destroy crops and livestock may be brought under control at once where methods have been worked out in similar environments. Control methods can be developed

for the rodents, insects, and rots that destroy food in storage and transit.

(6) Immediate expansion could be made of facilities for producing agricultural machinery, including trucks, pumps, and small tools. The machines used in America and Western Europe are not everywhere adaptable. Research is needed to develop suitable tools for farmers changing from a primitive subsistence level to an efficient basis but many significant steps could be taken now.

(7) Many useful simple illustrative pamphlets on the several phases of agricultural technology could be prepared now for use in under-developed countries. They should be adapted for use by the last man who can read in the chain between the heads of governments, down through the officials and clerks in government agencies and trading companies, to the individual farmers.

Progress toward an efficient agriculture depends more upon how much people want it than upon anything else. Perhaps we may say that first it depends upon how much people appreciate their interdependence. Understanding of the problems of food and atomic energy should hasten the day.

The goal of abundant food in the world is by no means a hopeless one, nor can it be reached easily. Whether the people of the world should have enough food or whether they will have enough food are not scientific questions. What soil science says is that if they want it, and if they are willing and able to develop the necessary social institutions, they may have it.

DISCUSSION*

D. GALE JOHNSON
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A synthesis of the two excellent papers presented by Messrs. Taeuber and Kellogg leads to the following rather depressing conclusion: There is only a very small probability that the three-fifths of the world's peoples that live in "areas where famines and epidemics, chronic malnutrition and debilitating disease" erupt periodically, will have a better diet by, say 1975, than they had in 1935. This is a gloomy prediction, yet the evidence in the two papers seems to me to support it strongly.

I reach this conclusion despite Mr. Kellogg's estimate that from a physical and biological standpoint output increases are possible that will permit an important improvement in per capita diets during the next decade.

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or two. Mr. Kellogg emphasizes that the physical and biological possibilities can be achieved only "if the political and economic barriers to effective soil use were somehow removed." I shall try to appraise the important political and economic problems that may limit possible increases in world food output.

The first set of economic and political barriers to increased food output is due to the geographic location of the new lands that may be developed for agricultural purposes. As Mr. Kellogg notes the new lands "are off our present routes." More specifically the new lands are far distant—in miles, in economic costs of movement and in political control—from the peoples subject to the greatest population pressure. Most of the hungry peoples of the world are in Asia. Most of the undeveloped lands are in Africa and South America; important amounts may be found in northern Russia, including Siberia, and in northern North America. The Asiatics are not now politically welcome as migrants into any of these areas. Even if there were no political barriers to migration, the sheer magnitude of the necessary movement would seem to make it impossible. A gigantic migration would be necessary to reduce the Asiatic population to a degree permitting a significant improvement in the diet. Indeed, it is doubtful if migration alone, without significant social, political, and economic changes, that will reduce fertility, could occur fast enough to reduce the population in the more thickly populated parts of Asia. The net effect might well be a reduction in mortality with no change in the fertility.

The second set of economic and political problems arises out of the necessity of industrializing the poorer nations. If migration to the undeveloped lands is impossible, the poorer nations must look to trade or to improving their own agriculture as the means of improving their diet. Both trade and improvement of domestic agriculture depend upon industrialization. The capital outlay for any significant industrialization of India and China staggers the imagination. At pre-war prices the U. S. had an average per capita investment of \$400 in manufacturing plants and steam railroads. This probably was no more than half of the total investment in our industrial machine, yet to achieve this per capita investment in China and India would require roughly \$350,000,000,000. The huge numbers that are involved in the poorer nations constitutes a significant drag upon the possibilities of improvement, even through industrialization.

Even if the industrialization process is seen in a more modest focus, it is not at all certain that political conditions in either China or India are conducive to the necessary capital accumulation. Incomes are so low as to place stringent limits upon aggregate savings. Politically, China is so unstable as to be unable to attract outside capital except as a gift from the United States, while the political division of India and the possibility of civil strife will make outside capital hesitant and available only at relatively high rates of interest. Other of the overpopulated areas are in a political turmoil, making it very difficult to attract capital.

A third facet should be mentioned. Much of modern agricultural technology does not economize land and thus increase output per acre. Its basic function is to economize on labor, as Mr. Kellogg recognizes. European

agriculture, largely because it uses so very much labor, gets larger yields per acre than we do in the U. S. The mechanization of European agriculture would reduce aggregate output. Some land would have to be withdrawn from cultivation, while other land could only be farmed much less intensively than at present. Much the same result might occur in other parts of the world.

Finally, it is not at all clear that there will be any significant increase in fertility control in the overpopulated areas of the world in the next quarter century, or for the next half century for that matter. If industrialization occurs at all, it will occur very slowly. The general change in values that accompany urbanization and higher incomes operate slowly to change viewpoints on family limitation. This is one of the important points stressed by Mr. Taeuber. Even though the trend toward industrialization and urbanization will not reduce fertility for two generations or so, the impact upon mortality will be rather immediate. Consequently it is not impossible that we will see a considerable improvement in sanitation, health facilities and related aspects of Western culture without any improvement in the diet. To a very real degree the history of the Philippines from 1900 to 1940 reflects just that—an important amount of capital investment, significant improvements in health, and twice as many people in 1940 as in 1900 having available to them no more than twice as much food in the aggregate. During this slow transition to industrialization it is not at all clear that food supply can keep ahead of the rapidly increasing population due to maintained fertility and a mortality that can and does decline rapidly.

Is it likely that very much new land will be brought under cultivation in the next quarter century? It seems to me that the answer is in the negative. The economic cost of development is very high. Unless the terms of trade are very favorable toward agriculture, there will be little incentive from an economic standpoint to make the necessary investments. And the terms of trade can turn in favor of agriculture only as one or more of the overpopulated areas become large importers of agricultural products. This in turn can materialize only as a result of industrial exports due to a significant degree of industrialization. Such is not likely to occur within the next quarter century.

This leads to a final point. Even if the world's population is now increasing at a rapid rate, there is no evidence in what Mr. Taeuber presents to indicate that the countries making up the Western Trading World are likely to long have an expanding population. Consequently, three-fifths of the people of the world may have seriously inadequate diets while at the same time the terms of trade may be very adverse for farmers in the Western Trading World. The supply of food in this area will continue to increase with technological developments. The only important factor increasing the demand for food will be increases in per capita incomes. Given the low income elasticities for food that seem to prevail among the more well-to-do in the world, it is unlikely that real incomes can increase rapidly enough to fully offset the change in supply.

This situation will present important international political issues that

will be most difficult to resolve. Part of the world will have a surplus of food; most of the rest will have millions of people with inadequate diets and will be so poor as to be unable to buy the food. The obvious solution is to move the surplus food from the one area to the other, either free or at low cost. But this is no solution at all. The Western World will simply have too many resources in agriculture, some should be shifted out. The recipient areas will receive no permanent gain unless something is done to bring fertility under control. Otherwise the food would be dissipated through an increase in numbers and no permanent improvement in the diet or well-being would materialize.

When we attempt to determine if population will outrun the food supply, we are really trying to determine if a significant increase in real income can be achieved. This is an extremely complex phenomenon about which we know all too little. This session has dealt with one of the most important as well as the most difficult of the social, political and economic problems that confront the world today. It is particularly important that scholars in the United States increasingly devote their energies and talents to this issue. If the United States is to maintain the role of economic and political leadership that has been thrust upon it, it must help the poorer nations to find a solution to their problem of poverty.

DISCUSSION*

R. P. CHRISTENSEN

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Dr. Taeuber and Dr. Kellogg have contributed much to a better understanding of the factors upon which future changes in world population and food production will depend. A more widespread recognition of the facts they have presented is greatly needed at the present time for at least two reasons. First, it is necessary if we are to take intelligent action to improve the per capita food supply, and second, it is necessary to correct some of the mistaken ideas that many popular writers on this subject have given to the general public.

The thinking of the popular writers to which I refer is something like this. World population doubled in the last century and probably will do so again in the next. The land area of the earth suitable for cultivation is limited. Less land per person is interpreted to mean less food per person. It is not denied that scientific advances may raise productivity per acre. But some contend that this will be more than offset by permanent loss and depletion of soil and water resources. Some go so far as to maintain that it does not matter what happens to food production because population will increase up to the limits of food supply anyway. They believe the only solution is more control over population growth.

What does Dr. Taeuber say about population trends? Perhaps most significant is his observation that modern increases in population are a

* A discussion given at the Annual Meeting of the American Farm Economic Association, Green Lake, Wisconsin, September 13, 1948.

function of control over mortality and that there is no evidence to support the view that increases during the century before World War II in any part of the world reflect increases in fertility. Perhaps few people realize that population growth in the last century was the result of a more rapid decline in mortality than in fertility. Control of fertility, which generally is associated with industrialization and urbanization, is the reason why population growth is leveling off in many countries. The fact that more people are living longer and more productive lives is, of course, a mark of progress.

It is apparent from what Dr. Taeuber has said that world population will continue to increase, but he does not say how much within a specified length of time. Forecasts of population growth must be based on assumptions with respect to future changes in fertility and mortality. The validity of these assumptions will depend upon the adequacy of the analysis of factors that may bring about changes in the levels of fertility and mortality.

It is noteworthy that one-fifth of the world's population—the one-fifth which has the highest standards of living and the lowest levels of mortality and fertility—still is expected to be stationary or declining within a few decades, and that another one-fifth is approaching this point at a rate which will bring it there within a generation or two.

But for the remainder of the world, demographic data are so incomplete that a projection of population change can be no more than an assumption. Large increases in the population of these regions have been forecast on the assumption that mortality will be reduced first and that fertility decline will lag behind as it did in other countries that have experienced industrialization and advancing living standards. But one might also assume that if such countries as China and India are to make much economic progress, lower levels of fertility and mortality will come about simultaneously.

To me, all of this adds up to a much lower rate of population growth in the next century than we had in the last.

But suppose world population reaches the 3 billion mark by the year 2000 as compared with 2.3 billion at present. Would it be possible to provide them all with adequate diets? I am sure that Dr. Kellogg's answer would be Yes. He has told us that, from a physical standpoint, there is no reason why the increases over the prewar food supplies that are estimated in the "World Food Survey" by the Food and Agricultural Organization as necessary to improve diets for the population expected in 1960, cannot be met.

It is worth while to note the emphasis Dr. Kellogg gives to the fact that estimates of the land area of the world that is suitable for crop production must consciously or unconsciously be based on assumptions regarding economic conditions. This may be one reason why the estimates vary greatly. For example, Carl Alsberg in *Limits of Land Settlement* in 1937 estimated that 6.4 billion acres could be used for crops if necessary. O. E. Baker in an article published in 1947 in *Maryland*, the alumni publication of the University of Maryland, estimated that about 4.4 billion acres is

suitable for wheat, rice, or other cereals. Recently Pearson and Harper in *The World's Hunger* concluded that only 2.6 billion acres, or about the same as now cultivated, could be used to grow crops. On the other hand, Dr. Kellogg indicates that 1.3 billion acres, an increase of 50 percent, could be added to the present cropland area. Besides land in crops, permanent pasture is an important source of our food supply. Alsberg estimated that land area suitable for pasture was about the same as the 6.4 billion acres of potential cropland.

The possibilities of expanding food output from the land now in use by raising crop and livestock-product yields probably are much greater than those that are possible by extending the area of land use. Dr. Kellogg indicates that a 20 percent increase in crop yields of the world, or about the same as was estimated recently for the United States, is possible by greater application of known techniques. Another approach might be to estimate the food potential if cropland is used as intensively and with as advanced methods as in some of the most highly developed agricultural countries. If productivity per acre averaged as high as in prewar Germany, total food output probably would be doubled or tripled. Of course, intensity of land use and the food output per acre will depend considerably upon economic conditions with respect to market demand which prevail over a period long enough for the necessary production adjustments to be made and for adequate returns to be had from the necessary capital investments. The intensity of land use that is profitable obviously will continue to differ throughout the world. In the several areas it will depend upon the supply of land and the level of demand for agricultural products in each country.

Dr. Kellogg did not say much about the extent to which depletion of soil and water resources has reduced the area suitable for agricultural use. But I am sure he would agree that land should be used so that its productivity is not permanently impaired. He probably also would agree that, so far, taking the world as a whole, losses in productivity caused by reduction in the native fertility of some soils and the permanent destruction of others have been offset many times by advancing farm technology.

This leads to the conclusion that the food potential of the earth is great enough to provide food enough for all the people that probably will inhabit the earth in the next century if that potential is properly developed. But it does not mean that this objective will be achieved soon. Our hope is that we may be able at least to remove the social, economic, and political obstacles to such an extent that progress in this direction will be more rapid than it has been in the past.

INTERNATIONAL FOOD AFFAIRS

Chairman J F. Booth, Department of Agriculture, Canada

THE FOOD SITUATION IN EUROPE IN RELATION TO THE WORK OF FAO*

SIR HERBERT BROADLEY

Food and Agricultural Organization

IN THE early summer of 1945 a rather significant meeting was held at Lancaster House in London. Lancaster House used to be one of England's ducal residencies; it then became the London Museum; and finally the meeting place of international conferences. On that occasion in 1945 it was housing the first meeting of the EECE—the Emergency Economic Committee for Europe.

I had the privilege at that meeting of proposing the establishment of a Food and Agriculture Sub-Committee. That Committee met almost every other week for nearly two years until its functions were taken over by other organizations. The EECE was the first cooperative post-war effort at European reconstruction, and the Food and Agriculture Sub Committee was the first attempt to deal on an international scale with Europe's food and agriculture problems.

Later in 1945 the FAO itself was brought into being. That took place at the Quebec Conference in October of that year. In the early months of its existence it was not able to render very much direct assistance to Europe. It was busy with its own internal organization—recruiting its staff and planning the field of its activities; but close cooperation was rapidly developed between FAO and the Food and Agriculture Sub-Committee of EECE. This was strengthened when FAO took over responsibility for what was called the Combined Working Party. This was a committee operating in London under the auspices of UNRRA, but containing representatives of the United States and British Governments, as well as of the economic missions or other representatives of European governments at that time established in London. That Committee had been endeavoring to assess the needs of European countries, released or being released from occupation, and to determine the supplies of food and other commodities available.

* A paper given at the Annual Meeting of the American Farm Economic Association, Green Lake, Wisconsin, September 13, 1948.

In August 1946 the FAO European Office was established at Rome, and since then it has played a significant part in the restoration and development of European agriculture. The Rome Office is under the control of the Director-General's personal representative for Europe and has a small administrative and secretarial staff. Its technical officers are assigned from the technical divisions at headquarters in Washington for longer or shorter periods according to the specific work they are sent over to handle. In this way centralization of policy is combined with local and regional executive action in conjunction with European member governments and European organizations.

The ECE—Economic Commission for Europe—was set up in March 1947, and the EECE disappeared after a period of activity which will be remembered with appreciation by most European countries. When the ECE was established, the activities of the EECE Food and Agriculture Committee were transferred to the FAO office at Rome. In order to maintain liaison with ECE, a sub-office FAO was opened at Geneva, where FAO personnel was able to work on European food and forestry problems with members of the ECE secretariat.

Later in 1947 another organization came into being in Europe, also directly concerned in food and agriculture problems—but this time covering only a limited part of the continent. It was the OEEC, set up to represent the 16 countries which are the beneficiaries of what they call in Europe the "Marshall Plan." This body—the OEEC—has its own Food and Agriculture Committee and is in direct touch with ECA in this country in regard to the operation of the Marshall Plan and the restoration and development of European food and agriculture which that plan makes possible.

The Food and Agriculture Organization, through its European office at Rome and its sub-office at Geneva, is now in a position to cooperate with these other economic organizations in Europe, as well as to render assistance to the European countries themselves. Nevertheless, the field in which FAO can render assistance is a limited one. It cannot order particular policies to be adopted, it can only advise, educate, and persuade. It cannot embark on the executive functions of purchase and procurement in order to stimulate output and equalize distribution; it can only recommend, demonstrate, and discuss.

Nevertheless, even though FAO's activities must largely be ad-

visory and consultative, it can render very great assistance to organizations with wider powers as well as to governments willing to take advantage of its technical experience and advice. In particular the machinery established in Europe for utilizing the grants made by ECA can enjoy all the service and advice which the economic and technical staff of FAO is in a position to offer. Moreover, the European governments themselves, in their own executive activities, can put into operation the plans and suggestions which FAO brings to their attention, either in direct contact or through local conferences, committees, and other meetings.

In developing its plans for assisting European, and indeed all other member countries, FAO has a three-fold policy. There is first the problem of today; there is next the problem of the coming five years; there is the problem of the coming century. A kind of "This year—Next year—Sometime—" program.

Some of the activities of FAO are designed to render immediate assistance—such as the allocation of food and agricultural commodities in short supply through the machinery of the IEFC, or the preparation of programs for meeting requirements of agricultural machinery and other equipment.

Other activities cannot come to fruition within less than the next four or five years and often longer—such as the elimination of animal diseases, the improvements of strains, and the reduction of losses due to infestation.

Other activities will produce their results only over still longer periods. These are the extension of irrigation, designed to bring large new areas into food production, afforestation and reafforestation schemes, designed to counteract soil erosion and restore fertility to the earth as well as to provide the supplies of timber which mankind will need in the future.

In all these these fields FAO is in a position to render assistance to Europe, either directly to the individual countries or in cooperation with such organizations as ECE, OEEC, and ECA. FAO can act as the doctor, diagnosing the disease, as well as the physician prescribing the remedy. Indeed, this exactly describes FAO's function.

Its Nutrition and Economics Divisions measure the present food standards and the economic wealth and activity of the country. It is the determination of food needs and the economic situation conditioning effective demand which are the justification for the advice

which FAO is able to render in regard to agricultural production and the distribution and utilization of food. Each area and each country has its own nutritional and economic problems. The standards of calory intake and the adequacy of supplies of protective foods for the different sections of the community are the measure of the supplies needed to produce health, happiness and wealth. This represents the diagnosis which FAO is in a position to carry out. Thereafter the Agriculture, Forestry, and Fisheries Divisions advise and assist in regard to specific remedies, while the Rural Welfare Division studies and helps in the development of all the rural amenities necessary to insure that food production is carried out as efficiently and happily as human beings can design.

But before we begin to consider what FAO can do in Europe to-day, either directly with member governments or in cooperation with the international organizations concerned, it is necessary to put the patient into the consulting room and diagnose the disorders from which she is suffering.

Europe emerged from the recent war with losses and damage which were not fully realized at the time. Indeed, most European governments and the great majority of the populations expected a rapid return to the conditions of 1938, and with all the new technical developments which had resulted from wartime economic activity, an even quicker recovery than that which took place after the first World War. There was a short honeymoon period during which controls were jettisoned or plans made for an early restoration of free activity, but when the facts and figures were collected, the economists, nutritionists, and politicians began to change their views. Unfortunately the facts and figures were not easy to collect. The statistical services of many European governments had been hopelessly disorganized by the war. Internal transport and communication were slow in restoration. Farmers were reluctant to disclose their supplies or output for fear of their being taken away. The whole atmosphere of wartime occupied Europe persisted, when it was a patriotic duty to mislead the occupying forces regarding the food position. Consequently Europe was slow in assessing her true situation.

Indeed, it was not until the United States made that unparalleled gesture of the European Recovery Program that the countries concerned committed themselves to definitive figures for present and future years. That gave the first real forward appreciation of

the position for a large part of Europe since the end of the war. That appreciation has been extended and amplified by the "Survey of the Economic Situation and Prospects of Europe" issued by the ECE this year and by the FAO report, to which I shall refer later, "European Programs of Agricultural Reconstruction and Development."

Had the FAO been in existence for a number of years and been equipped with a fully operating European office it might have been able to bring the facts of the situation to the notice of member governments at an earlier date. But lack of information within the European countries themselves would have been a great obstacle in the first post-war years. FAO did call urgent food conferences, first in Washington in 1946 (in continuation of the EECCE Cereals Conference in London in the spring of 1946), and again in Paris in 1947, to draw attention to the serious food position of the world and particularly that of the European countries.

Perhaps the most comprehensive (and by no means reassuring) appreciation of Europe's present and prospective outlook in the field of food and agriculture is that contained in the FAO publication to which I have referred—"European Programs of Agricultural Reconstruction and Development." It has already secured wide interest and it is unnecessary to repeat its analysis and findings in detail. This publication gives the position of today, the probable outcome in 1950-51 of the present plans of the European countries, and compares them with the position which existed before the war. Even assuming that the plans of the European governments materialize, the outlook, though improving, is still unsatisfactory, and it will be much later than the early 50's before Europe re-establishes, for its increasing population, the standards of living of the late 30's or improves them to the higher standards already operative in the United States and other more prosperous countries.

At the present time only two or three European countries have restored or surpassed the pre-war levels of food production. Half a dozen, mainly Western European countries, are approaching their pre-war figures. The remainder, mainly Eastern European countries, still fall short by a quarter or a third of their pre-war food output. Had populations remained stationary, this would have been unsatisfactory. But populations, in spite of war losses, are forging ahead at an unexpected rate. Consequently Europe has still a long way to go before it can even restore its pre-war average

standards. It has, in addition, its balance of payments problems, which, but for the temporary assistance of the European Recovery Program, would call for still higher production in Europe to prevent widespread famine during the next few years

All the European countries are developing plans substantially to increase food production. If they materialize, Europe as a whole will almost have re-established its pre-war acreage of cereals by the early 50's and have somewhat exceeded its pre-war acreage of sugar and vegetables. But owing to shortage of equipment, fertilizers, and similar factors, the actual output of cereal crops will be less in 1950-51 than it was in the immediate pre-war years. And this, after the stimulus to European production produced by the present realization of its serious plight and the assistance provided by the European Recovery Program of the U. S. A. By 1950-51 Europe will have restored its livestock population, except possibly in regard to horses, but its output of meat and dairy products will, by the early 50's, still be less than it was in the pre-war years. Fish production, on the other hand, should be well in excess of the pre-war supply.

With the balance of payment problem pressing heavily upon Europe's import program, European governments are making strenuous efforts to increase their own cereal production. But as their cereal acreage goes ahead, and as the output of that acreage is increased by improved methods, mechanical assistance and better strains, population, too, is advancing. There are more mouths to be fed

Moreover, the amount of additional land in Europe suitable for cereal cultivation is limited, so that any great expansion of acreage inside Europe is improbable, except possibly at the cost of a greatly reduced livestock population. On the basis of the FAO report on the European programs, it will be seen that Europe's gross net imports of cereals for 1950-51 are programmed at more than $15\frac{1}{2}$ million metric tons. This is after providing for the complete restoration of the pre-war cereal acreage in Europe. An import of $15\frac{1}{2}$ million tons of cereals in 1950-51 is actually over six million tons more than the average pre-war imports

There are several reasons for this great import increase in need. Even with the restoration of the pre-war acreage, indigenous production, owing to shortage of supplies equipment, etc., is expected to be 2,300,000 tons below pre-war. Furthermore, Europe is not

counting on recovering its pre-war rice imports of one million tons. Its population will be 5 percent larger, and some countries will still be short of other foodstuffs.

One of the most serious problems with which Europe will be faced during the coming five years is therefore whether the world will be able to supply it with this enormously increased supply of cereals which it needs, and if so, whether Europe will be able to pay for it in the currencies which the sellers will demand.

In the estimates of world cereal supplies made by FAO in its publication on European programs, doubt is expressed whether there will actually be available in the world in 1950-51 for shipment to Europe the 15½ million tons on which the European program is predicated. If this supply is not available and if the growing populations of Europe are inadequately nourished, then the industrial programs, too, will fall short of achievement and the European economic problems be still further aggravated and their solution still further postponed.

Much the same considerations apply in regard to other foodstuffs which Europe needs, particularly oils and fats and meat and live-stock products. There is no doubt, therefore, that even with the assistance of the supreme effort which the United States is making through the European Recovery Program, Europe has still many problems to solve before its teeming millions are restored to their pre-war standards of living or brought to happier and fuller lives.

FAO's policy in regard to these problems must be first to discover where and in what fields additional production can be planned and then to help and advise in its achievement. The following are some of the measures FAO has recently adopted or is adopting in Europe. Others of a similar character will follow:

A meeting was sponsored at Bergamo, Italy in the summer of 1947 in which plant breeding specialists from nine countries met to consider ways of utilizing hybrid corn for the benefit of European agriculture. This was the first such meeting in Europe and marked the beginning of a considerable increase in maize production, particularly in southern portions of the Continent. FAO has followed up this meeting by supplying hybrid seed for experimental tests and also by supplying open pedigree inbred line seed for the use of experimental breeders. Most of this seed has been donated, either by State or Federal Experiment Stations in the U.S.A. and Canada and by private breeders. Another meeting will be held dur-

ing the coming winter to enable the workers engaged on this program to compare the tests made in various countries and to lay plans for the breeding programs to be carried out during 1949. Attention is given in this program not only to maize for grain production but also to silage varieties.

A meeting was sponsored in Weybridge, England, during the summer of 1947 in which veterinary workers from thirteen European countries participated. The main purpose of this meeting was to acquaint workers in countries that had been shut off by the war with the latest developments in the production of veterinary vaccines and serums. A further meeting is planned on animal health problems in Krakow, Poland, in November 1948. This meeting will have as its primary object a discussion of diseases that are of particular importance in the Eastern European countries and will deal not only with methods of producing vaccines and other control agents but with the field control of these diseases. Workers both from the Eastern European region and from Western Europe and FAO headquarters will join in the discussions.

A world-wide meeting on the control of infestation in stored food products was held in London last year and many of the European countries participated. The technical material presented at this meeting has been published in FAO Agricultural Studies, Series No. 2. A further meeting of specialists is being held in Italy at the present time to discuss the specific problems of reducing losses of stored grains in European countries and to acquaint technicians from various countries with the latest developments in this field. Attention will be given to commercial and also to farm storage problems and, incidentally, some material will be presented on other aspects of pest control.

At the present moment a conference is being held in Italy on soil conservation to which the interested European governments have been invited. The latest developments to combat erosion and increase fertility are being made available to the members of this conference in the expectation that they will be adopted in various parts of Europe. Two advisers are being provided to the Government of Italy to assist them in setting up a nation-wide conservation program and improving the management of their grazing lands.

But FAO is helping Europe by the activities it undertakes in other parts of the world, as well as those which it organizes inside

Europe itself. This coming fall there is to be a conference on rinderpest at Nairobi, in East Africa, to which will be invited animal specialists from interested parts of the world, particularly South-east Asia. If the outcome of this conference results in the adoption of preventive and remedial measures in Siam and other parts of Asia, the draft animals there will be more efficient, and increased supplies of rice will be produced. With an increase in the output of rice in Southeast Asia, there will be less demand for wheat and flour by India, China and other countries, resulting in larger supplies of Australian wheat and flour being available for European countries. If FAO can assist in the development of oil seed production in Africa, this will make available to Europe supplies of food from areas with which balance of payment difficulties do not exist. There are many areas where food production can be developed which do not involve the payment by Europe of those precious dollars of which she is so short.

It may even be that ECA can, in certain cases, render more direct assistance to the European countries in their recovery programs by assisting the development of food in such areas than by giving direct assistance to the European countries themselves. Australia still has vast areas capable of producing cereals and livestock products. Southern Rhodesia could carry a large livestock industry. Oil seed production could be developed on a much greater scale in both East and West Africa. Rice production in West Africa on a mechanized basis might restore those million lost tons of rice imports which Europe received before the war.

Although FAO cannot itself undertake these developments—it must leave them to the interested countries—it can, however, assist and advise in their development and put at the disposal of the countries concerned the best experts in the different fields. In such a way FAO can and does help European reconstruction by activity outside Europe itself.

So much for the immediate future in the fields of food and agriculture, and it is perhaps sufficient for European countries to concentrate for the moment on the problems immediately besetting them. With their growing populations and their balance of payment difficulties—difficulties which will certainly not be solved during the present decade—they have a serious enough problem in trying to make both ends meet during the coming years and restore the standards of life which existed before the war. But to those who

look ahead, that is not sufficient. If European civilization is to survive, it will not survive on the basis of a struggle to maintain the inadequate standards which were achieved in the 30's. Populations seeing the standards of prosperity prevailing elsewhere in the world will not be satisfied permanently to accept something lower for themselves. The rest of the world is itself rapidly industrializing and no longer willing to exchange its foodstuffs on such favorable terms with Europe as it did in the past. The whole balance between industrial products and agricultural products may be changed.

The United Nations Department of Economic Affairs has just issued a study of selected world economic indices. These show that while the total world supply of goods represents 110 percent to 115 percent of the pre-war figure, agricultural production is about 93 percent of pre-war, and industrial production between 130 percent and 135 percent of pre-war. The relative lag of agricultural output has resulted in the relative increases in prices of agricultural products. This means that the terms of trade have turned against the industrial countries, a fact of great importance to European countries anxious to exchange their industrial products for the foodstuffs they need to feed their populations and raise their standard of living.

If Europe is to obtain the food she needs on the best possible terms in exchange for her industrial output, she must deliberately plan her export trade to the food-producing countries and particularly to the areas where it can be produced more cheaply than is at present possible in the western world. Africa, the Middle East, parts of Asia, and Australia may be the areas in which capital development should be undertaken on a long-time basis to provide Europe with the food she requires in return for industrial products.

Inside Europe, too, there is the possibility, by the development of east-west trade, of industrialization and increased food production through more intensive methods, marching side by side. The ECE has just released an analysis of east-west trade in Europe, drawing attention to the possible increase in food supplies from Eastern Europe in exchange for the output of Western European industry. ECE estimates that by improved methods of production, cereal supplies in Eastern Europe might be raised by 12 million tons. Moreover, they point out that this need not be prejudiced by increased industrialization in Poland, Yugoslavia, and Hungary, assuming that populations do not rapidly increase. It is, however,

true that the first consequence of industrialization has usually been a rapid rise in population, with a slowing down as industrialization leads to higher standards of material wealth.

In the past, the world, and particularly Europe, has had three food crises. The first came during the Napoleonic wars and was remedied with the development of intensive British agriculture and a restoration of transportation in the early 1820's.

The second period came about the middle of the century, when the rapidly increasing populations of Europe were outgrowing their resources. This crisis was solved by bringing into the world markets the vast food supplies of the American West.

The third period started about the end of the century and was not really solved until after the first World War, when large-scale farming in Australia, Argentina, and Western Canada again brought a new supply of food to the industrial countries of Europe.

We now seem to be approaching a fourth crisis, and without the possibility of the remedies which cured the three previous crises. The unused lands of the world capable of food production are no longer unlimited. Moreover, many of the existing lands are losing their fertility as the result of centuries of misuse and soil erosion and may have to be rested for long periods before they can provide their present outputs over a long future period. And in the meantime populations are increasing at an alarming rate, while countries which previously supplied Europe with food are industrializing themselves in the vain hope that industrialization alone will mean a higher standard of life. There is, therefore, a real danger that Europe may not find an increasing outlet for its industrial products—even in the new areas of Africa, the Middle East, Asia, and Australia—and be driven to produce more and more of the food it needs. More mechanization, more up-to-date methods of farming, and increased use of fertilizers will all be needed in Europe. In these fields FAO will be able to render help and advice.

International commodity agreements, such as the recently still-born Wheat Agreement, will be necessary if the world is not to get completely out of balance. To leave commodities to find their own level through the free exchange of the price mechanism in such circumstances would, in the long run, be disastrous to food producers and food consumers alike. During the transitional period, until new sources of food are available, some controls and much planning will be unavoidable. Europe in particular will need such help and assistance if she is to survive the coming years.

But while Europe's land resources must be developed efficiently and with wisdom, the sea may provide new resources awaiting development. This will be particularly important if the pressure of population leads to greater and greater intensification of food production, and therefore involves an increasing drain on the soluble nutrients of the land.

While there may be vast deposits of phosphorus, potassium and other elements which enter into fertilizer in the earth's crust, to some extent the procurement of these chemicals is an extractive industry and the costs of getting them will become greater and greater as workable deposits become scarcer and scarcer.

To all intents and purposes, it is true that matter cannot be destroyed, and in a sense nothing is really ever wasted. On the other hand, even though not wasted, its availability may change. For instance, the continual inundation of the earth by the greatest of all solvents—water—has the effect of washing the end products of life into the rivers, the draining systems and eventually into the sea, so that in the very long term, man must turn his attention to this great reservoir of energy and materials, and reclaim them for himself and the land. He may do this in two ways. First, he might utilize to a much greater extent the living products of the sea, and second, he might use it as an inexhaustible source for some of the chemical elements which he needs to maintain fertility of the land. And so the oceans, which first gave rise to life, may eventually become the ultimate source of its maintenance.

Of course, the whole position in regard to food, clothes, and housing may be completely changed as a result of scientific developments. Atomic energy has its incalculable benefits, as well as its dangers for mankind. We have already found out how to synthesize edible fats, and thus to produce calories from sources other than the land. We have not yet succeeded in synthesizing proteins, but who knows what is still unrevealed in the womb of time? Scientific developments may alter all our conceptions of food problems and the resolution of Europe's difficulties.

For the present, however, we cannot count on such unknown factors. Europe must be fed, clothed, and housed, and the land is as yet the only source from which she can obtain most of what she needs. During the last 60 years, the world has seen two complementary tendencies. We have been taking the food to the people and the people to the food. Europe has sent her millions to the western world to produce food there, not only for themselves, but for the

millions who remain behind. There are still some lands where more food can be produced, crying for population. But these lands are limited. Moreover, these very lands insist on developing their own industrial resources, so as to be less dependent on imported supplies. Europe must develop her own supplies intensively, expand east-west trade so that food production within the continent can balance industrial output to a greater extent than at present, and encourage some of the population which cannot be fed at home to find a home in other areas where the needed food can be more easily produced.

These are long-term considerations. They are, however, problems with which FAO is concerning itself and on which it will, from time to time, report to its member governments and collaborate with other international bodies. FAO will continue to diagnose not only the immediate ills of its patients but also the potential ills they may suffer as circumstances change. And it will endeavor to devise and provide the remedies for present and future ills.

Its economists, its nutritional experts, its technical workers, and its scientists are already actively engaged in many countries directly with the governments concerned and also in cooperation with the European organizations, such as ECE and OEEC. With them it will labor to help Europe through its present difficulties and to find a solution for the vaster problems which may well mean life and death to the coming generations.

ISSUES IN AMERICAN FOREIGN FOOD POLICY*

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EXHAUSTIVE treatment of this topic would be a far more ambitious undertaking than I am prepared to attempt. I am interested in the many important problems which it suggests. From observation of events during and since the war, I have perhaps gained some familiarity with a few of these problems. But my direct participation in this area of government activity was brief, intermittent, and is now sometime in the past. I have had no opportunity for really intensive study of current developments. In assigning the topic to me under these circumstances, I understand that your program representatives mainly desired a brief review of a few selected aspects of the developing situation, which would re-emphasize some of the important difficulties and problems confronting the United States in relation to its participation in international food affairs.

Events during and since the recent war have thrust the United States into a position of world leadership where its actions may be decisive in determining the future course of international economic and political relations. Under conditions of today, which offer so many striking contrasts to those envisaged for the postwar world, constructive leadership requires forward looking decisions that are both positive and consistent on a great many fronts.

But the United States has lacked experience and in other important respects has not been well equipped for this relatively new role—limitations which sometimes delay the complex process of policy determination and render the outcome uncertain. In its relatively short previous experience as a world power, this country participated in world affairs intermittently as matters arose which were recognized as affecting the national interest. Moreover, this participation was often somewhat negative in character as contrasted to the positive requirements of leadership, and was conducted upon the basis of independent decisions with respect to the succession of problems which arose. Against such a background it is understandable, perhaps it should be recognized as inevitable,

* A paper presented at the Annual Meeting of the American Farm Economic Association, Green Lake, Wisconsin, September 13, 1948.

that earnest efforts to fulfill the newly assumed responsibilities of leadership should reveal defects of omission and commission, contradictions, conflict, and lack of continuity that appear almost as characteristics inherited from the earlier experience.

That the United States has been active in international affairs, and that this activity has had sincere support from the electorate cannot be denied. In fact one limitation may arise from recurrent excesses of public enthusiasm for measures that will not be supported in the long run. But these have their counterparts in other instances of public misunderstanding, scepticism, and even indifference which contribute towards delay in obtaining support for necessary action—as occurred in the evolution of policies of recovery aid to European countries. Too often, of course, these are attributable to overstatement and understatement by the government in seeking support for its programs. Both contribute to further widening of the gap between government decision and public support.

Regardless of the support for positive participation and leadership in international affairs that has been apparent, we must not ignore the fact that the country retains a solid core of isolationism. Sometimes evidence of this appears in the demands of groups who quite probably are unaware of its implications and certainly would resent use of the term in characterizing their views. Closely related, if not identical, are the powerful pressures exerted by special interest groups which, especially in election years, exert an influence upon government decisions out of all proportion to their real importance.

Further limitations upon actual performance arise from observable defects in the mechanism of government for formulating the decisions required. Not only does the constitutional structure divide responsibility and authority as between the executive and legislative branches in such a way as to hamper the effective handling of many problems, but the executive establishment has developed along lines which multiply the possibilities for confusion and contradiction, especially in the conduct of foreign economic affairs. One rather conspicuous result is the tendency to obscure the important interdependence of activities undertaken in the domestic and foreign fields.

Many of these limitations may be observed in the handling of food matters included in, or related to, our foreign economic and

political activities During the first phase of active defense preparation in 1940 and the early part of 1941, administrative policy amounted to a denial that there were significant food aspects to this country's problem of preparation for possible war, except as steps could be taken to increase agriculture's share in the economic benefits from expanded defense activity and compensate the further loss of outlets for agricultural exports that was anticipated. Even the measure of encouraging a moderate expansion in pork production to cover prospective increases in demand became at times a topic of bitter controversy, though it offered an outlet for feed supplies that were then looked upon as burdensome surplus.

Such controversy disappeared after the inauguration of lend-lease, and during the first two years of United States participation as an active belligerent the pendulum swung far towards the other extreme For a time, willingness to impose domestic sacrifice and accord priority to lend-lease export requirements may have been over-emphasized in statement if not in practice.

As the war progressed to the point of liberating allied territories from enemy occupation, the large foreign policy significance of economic assistance, including lend-lease and relief exports of food, was stressed. Promises were made which were over-enthusiastic and unrealistic if not actually irresponsible But officials responsible for such matters did not use their influence in seeing that necessary steps were taken to fulfill these promises, at least not until it was too late to significantly affect actual performance. As one evidence of this, financial requirements were not always anticipated or co-ordinated with production, procurement and supply activities.

Of more importance, however, was the substantially independent food policies which resulted in inadequate provision for supplying the export programs Many considerations influenced this outcome, among which an unimaginative conception of the problem, concern over the post-hostility price of farm products, political timidity in the face of domestic market demands for more food, and what seemed at times to be a fundamentally isolationist outlook which could not comprehend the possibility of public support for continued food shipments after the conclusion of hostilities, collectively were not unimportant But the developments in this period especially illustrated the defects of the existing government organization for achieving anything like a balanced recognition of the diverse

any participating country will depend upon what its economy can support. This, of course, will be increased to the extent that recovery has been achieved. But the limits of progress attainable are determined by other things in addition to the availability of external aid during the period of reconstruction and development. Such considerations as the resources available, organization of the internal economy, political stability, capacities and aspirations of the people also are important. Use of the limited resources available for foreign aid to establish levels of food consumption during the recovery period higher than can be supported when the aid program is terminated would. (1) Reduce the amount remaining for capital expansion, thereby limiting the extent of recovery and lowering the level of consumption that could be supported later, and (2) necessitate a downward adjustment of consumption to make the economy self-supporting when outside aid is discontinued. Each of these results would be contrary to the purposes of the program.

In view of these considerations, I conclude that food exports should continue to be important in this country's contribution to economic recovery abroad. In defining the goal of a self-supporting economy it is desirable to seek such improvement in levels of living, including diets, as is feasible. But in no instance should our foreign aid be directed towards establishing a level of food consumption within a receiving country higher than that country can support when the program is to be terminated.

I do not know what longer-term program standards are being formulated or will be finally adopted by ECA. But from observation and past experience it is not difficult to suggest influences that will tend to increase the amount of food aid above the level I have tried to define, and hence some of the issues involved.

For one thing, there is a very real possibility of over-estimating the level of consumption that can be supported on the basis of the reconstruction and development that can be achieved. Although consumption in the war-devastated countries has been low by any standards that might be applied, it has been kept high by comparison with production through large net imports. Only a cursory review is required to reveal the appalling size of the deficits created by these heavy import balances and, in the case of certain countries, by the decline in income from investments abroad and shipping or other services. There is a chance that it simply may not be possible to close this gap solely through recovery and development of agri-

culture and industry within the period of continued assistance. even if that period is extended well beyond any date contemplated in the legislation so far enacted. In such event the gap would have to be closed through the downward adjustment of consumption, including food consumption, for self-support to be achieved.

I have the impression that plans of the governments in devastated countries mostly do not contemplate the possibility of such downward adjustments. Instead they look towards increases above prewar levels, increases to be supported through extensive further development. Among the factors behind this appears to be a general shift in attitudes in the direction of accepting higher standards of consumption for the lower income groups, perhaps attributable in part to the experience with substantial redistribution of income and more equal sharing of scarce goods during the war. Whatever the cause, this trend may be desirable, so long as it does not go beyond what can be accomplished. But mistakes in evaluating the potentialities for recovery and development which resulted in the establishment of levels of consumption that could not be maintained beyond the period of external aid, might well result in the necessity for later adjustments that would have disastrous effects upon economic and political stability.

It is also quite possible that humanitarian and welfare considerations, accepted standards of nutritional adequacy, and short-run criteria relating to the prevention of social unrest and political instability, all will argue for United States assistance in supporting food consumption at levels higher than I have suggested. Considerations of need, equity, or fairness in the apportionment of assistance among nations so as to achieve greater equality in consumption may be especially important, since these tend to be presented forcefully and persuasively in the kind of negotiations involved in the co-operative programming of external aid. During the period of active aid, grants to countries lacking the ability to repay do effect a re-distribution of income. Moreover, the positions of the lowest income countries should be improved by the development which they achieve. Beyond this, however, as Professor Schultz emphasized in his paper, "Food, Agriculture, and Trade," presented before this association two years ago, "No rules, principles, and institutions have been developed, first to check and then to lessen the very wide gap as between different nations in income per head."

A further issue arises from the recurrently strong temptation to

attempt the purchase of immunity to the spread of communism by supporting the consumption of food in particular countries above the level for which I have argued. There appears to be little doubt but what this conception of foreign aid policy is a factor influencing support for the program by important groups in this country. History so recent as the past year has shown it may be effective in accomplishing short-run political aims. But if it is true that communism thrives upon economic demoralization, then yielding to this temptation to any large extent would seem to offer one of the most certain methods for defeating, in the longer run, the original purpose.

Probably the greatest threat to a constructive policy course that I see in the present situation arises out of the tendency to look upon the European Economic Cooperation Program, together with United States assistance to other areas, as a means of expanding the outlets for exports of agricultural commodities to benefit domestic farmers. I need not expand the point for this audience which should be more familiar than I am with the alertness of numerous agricultural pressure interests in exploiting opportunities to practice export dumping under a more defensible title. But if I have succeeded in making my point of view at all clear, you will understand why I am inclined to attach importance to the provisions relating to "surplus agricultural commodities" in the Foreign Assistance Act, as possible evidence of a grave weakness in the foreign food policies that we are evolving.

My choice of material and the organization of this discussion probably has revealed something of my concern over the maintenance of longer-run economic stability throughout the world. This reflects the importance which I attach to the problem of avoiding the kind of collapse that would bring mass unemployment and resulting widespread political unrest. In part also it indicates my feeling that there may be a significant gap in United States policy in the sense of a failure to face the problem of maintaining international economic stability. Because of these views, I am inclined to emphasize the danger that lack of foresight and lack of integration in United States policy could become a positive factor of instability.

Postwar economic instability has been a major danger in the view of most other countries. Those representatives of other governments with whom I have had contact have not appeared to be

greatly impressed by their observations of preparations to insure the maintenance of employment in the United States. Certainly the nations which participated in the successive trade conferences made abundantly clear their fears of becoming a part of a free-trading world economy in view of the dominant position occupied by this country and their lack of respect for its ability to maintain stability.

These fears have recently been less in evidence, in part perhaps because foreign representatives have looked upon United States grants and credit for recovery and development as providing ample support for domestic employment. But if this is not to be continued indefinitely, is there not a great danger of disastrous instability, especially if the economies of European countries adjust themselves to a position of dependence upon such assistance and then are forced to make drastic readjustments, when the aid is terminated?

In the commodity field, and especially in relation to food and agriculture, it seems to me the United States has consistently opposed consideration of international stabilization measures. In part this appears to have reflected the view that any such measures would be in conflict with a policy of free multi-lateral trade, although in part it may also have reflected a general domestic attitude towards decontrol. At any rate the United States has been unyielding in its refusal to consider stabilization undertakings—as, for example, in the FAO Preparatory Commission on World Food Proposals during the winter of 1946-47—excepting only the one device of international commodity agreements. Not only was this device offered as an alternative to all other proposals but it has been insisted upon as necessary to deal with the impending situation.

I shall not take the time to enlarge upon my personal skepticism regarding the possible effectiveness of commodity agreements. Suffice it to say that I question whether any individual commodity arrangements are likely to prove adequate for stabilization purposes, and that I also doubt whether agreements such as the proposed wheat agreement would actually work in practice. But those of you who disagree with me in this view should be able to recognize even more easily than I the important political issue that has been created by failure to ratify the wheat agreement. Having advanced commodity agreements as offering virtually a complete solution to the problem of international commodity stabilization, and having demanded detailed provision for such agreements in the charter

for the proposed International Trade Organization, the country has now failed to ratify the first important agreement negotiated. Certainly this places the government in a position of acute embarrassment in its dealings with other countries and hence may have repercussions upon the effectiveness of its leadership in the future.

DISCUSSION*

LEONARD K. ELMHIRST

Dartington Hall, England

It is a privilege tonight to speak under the chairmanship of Jack Booth. His services to F A O. and to our International Conference of Agricultural Economists when it met at Macdonald College in 1938 have rightly established his reputation in the field of international statesmanship.

There are exciting aspects to Sir Herbert Broadley's paper which you will have noticed. He speaks and treats of the human family as one, as living in one house with one larder. That is still a revolutionary conception. In his description of the work of the different agencies he gives us with our very short memories an historical perspective which we badly need. As he measures for us the material requirements of the citizens of Europe, he challenges us to consider how best we can put economics and science at the service of humanity and of man as a consumer of material "goods."

In treating of policy, Dr. Rowe, however, reminds us that man is not only a consumer of material "goods" but a man of feelings, capable of quite contradictory kinds of reaction according as to whether he is stimulated by fear or by courage and hope. You will notice that he makes an appeal in his formulation of a foreign food policy in America for statesmanship, leadership, imagination, courage, consistency and the long term view. He reminds us that the American public is capable of scepticism, indifference, isolationism, and near-panic and is always subject to pressure by special and not always unselfish interests. He tells us that administrators can be weak, can make promises they know they can't keep and can and do lose sight of sound principles and of long term needs in their search for day-to-day remedies.

He points out that stability in Europe can as easily be threatened by poor statesmanship as by unsound economics and that Europeans, as full of aspirations and of positive capacity as other men and women, need to feel confidence in themselves as well as in American policy. Can such confidence be instilled, he asks, by offering them limited material aid for strictly limited periods? Shots in the arm, he suggests, must not only be economically sound but the psychologically appropriate if they are to revive our self-respect in Europe.

* A paper given at the Annual Meeting of the American Farm Economic Association, Green Lake, Wisconsin September 13, 1948

Within our own recent memory we have three examples, perhaps unique in all the history of the world, of international statesmanship which managed to combine sound economics with that psychological gesture that leapt right across traditional barriers of nationalism. So soon we forget or explain away gestures which at the moment they were made fired by their grandeur the imagination of men. The offer of lend-lease to Britain and her allied democracies, when struggling for their very existence, the offering of Marshall Aid at the lowest moment of our postwar hopelessness, and the challenge in 1940 on hardly any sound base of economic resource at all which Winston Churchill flung to responsible citizens in the fighting democracies everywhere.

In the middle thirties, Lord, then, Mr. Keynes returned to London from a visit to Washington and the White House. My wife put to him this question: Is economics today such an exact science as to enable an economist to advise a statesman with confidence in matters of public policy? "No," said Mr. Keynes. He then went on to explain that although man is a "goods" consuming creature, he is also a spiritual being and a social animal and that our capacity to measure his reaction under different circumstances is as yet inferior to our capacity to measure his material and physical needs. It is, he said, still the function of the statesman, while sensing the need and preference of his public and whilst using all the economic wisdom available, to build up confidence in his capacity to lead to the limit of their capacity to follow his guess. It is well then to recognise that our capacity to measure human reaction is still largely guesswork, that a people can show a negative reaction to fear, that, when inspired by an appropriate expression of trust and affection, they are capable of releasing astonishing bursts of energy and enthusiasm.

When released from fear and deeply inspired they are capable of an effort so incredible as to be comparable in the field of the physical sciences to the release of energy from the atom.

The challenge these two papers present then is to the economist to marshal all measurable facts in usable form for the service of the statesman and to the statesman, armed with all the services we economists can render, to make that psychological gesture as they term it in the theatre, that grips men's feelings and stirs their imagination and courage into action.

The day may come when the psychologists and the social anthropologists can also come to aid the statesman with measured data upon which his hunch or guess can be more solidly based than hitherto.

What the European nations need today is faith in themselves and in one another as well as in their family interest as human being regardless of national frontiers. They are not sure today how to develop this faith or whether America will stay with them long enough to prove her faith in their capacity. Inspired, we Europeans can be decent people, patient, tolerant, self-respecting, kindly, and courageous. Depressed by fear and bitter memories of our failures and shortcomings in the immediate past, we can be guilty of stupidity, intolerance, panic, persecution mania. We can even develop a craving for regimentation as a means of escape and demand some Pope or Papa or "ism" to rescue us from our childlike terrors.

All the financial devices, all the customs, unions, and trade treaties that economists can devise which fail to take these psychological factors into account will not by themselves get Europe over its next hurdle.

Dr. Rowe asks whether aid to Europe in limited amounts for strictly limited periods is likely to succeed. If the spiritual climate is right it may be sufficient, but the right challenge at the right moment in the right terms must also be available if the needed energy and drive is to be released.

The non-convertibility of sterling and dollar along with the rise in the inflationary spiral certainly plays a disintegrating role at the present time. The conscientious European is fast developing a feeling of guilt whenever he allows himself to covet American goods, tobacco, books, foodstuffs, or labour-saving machinery. He is being conditioned not to look in your direction at all for anything, when he should be much more discriminating and be saving such dollars as he can earn for those goods that will help him to stand once more on his own economic feet. He is also beginning to feel that he can never get around the corner and this hurts and undermines his self-respect. Too long or too great a pressure of this kind can have a devastating effect on his morale and on his capacity to respond to wise leadership. As I look out upon the concentrated economic wisdom gathered in front of me, I can't help but think that you should be able to use it to challenge us in positive ways and thereby arouse that hope and faith which will release unbounded energy and yield positive results in a spiritual as well as in a physical sense,

AGRICULTURAL STATISTICS

Chairman Milton H. Button, Wisconsin State Department
of Agriculture

STATE FRONTIERS IN AGRICULTURAL STATISTICS*

ARNOLD P. BENSON
Illinois Department of Agriculture

I AM conscious of the honor you do me in inviting me to participate in the program of the annual convention of the American Farm Economics Association. I sense too the responsibility that goes with such an honor, and I feel humble in speaking to you today on this subject. My views and my observations are based on a general interest in the subject of statistics, not unusual for one with a background of experience in newspaper publishing and editing, and my close association with our Agricultural Statistics office during the time I served as the Illinois Director of Agriculture.

A responsibility of State Departments of Agriculture in the United States is the basic field of agricultural statistics at the state level. For many state departments it is one of their larger responsibilities, and it has provided a growing opportunity. As our economy has become more complex and agriculture itself has become increasingly commercial, the need for more complete and timely statistics has become clear.

When agriculture was simpler and more self-sufficient it could get along with less information, but today with an agriculture depending mainly on the markets we have a much more sensitive situation. The opportunity to make and lose money on the farm is vastly greater now than it used to be. The demands of recent war years as well as the depression years taught us much about the growing range of needs in this field, and we now know that as our economy grows older the work in and use of agricultural data become more important. State departments of agriculture which have not already done so should recognize the expanding use and need of agricultural statistics and make provision for this work at the state and local levels. It is well known that State Departments of Agriculture vary

* A paper read at the annual meeting of the American Farm Economics Association Green Lake, Wisconsin, September 13, 1948.

greatly from state to state and that the state efforts in agricultural statistics have varied likewise

In Illinois some 75,000 pieces of mail go out to farmers, farm service organizations and the press in an average month. Mimeograph runs will approximate 140,000. Crop reporting accounts for most of this mailing, and our crop reports include all important types of agricultural production in our State.

The value of this work to Illinois farmers and to agencies that provide information to farmers is evidenced from the excerpts from a recent letter received by our Department from *Prairie Farmer*. I quote

"The more scientific and complex that agriculture becomes the more farmers and manufacturers serving the farm field are relying upon statistics for their work. We are finding an increased demand on the part of both our readers and the manufacturers, who regularly use these columns for advertising of their products, for up to the minute statistical information about agriculture in the State.

"Probably the most valuable service that your division of Agricultural Statistics offers is the county analysis of the various classifications which it turns out. We have found that this service has no peer among the various services received in this office."

Today I will try to review some of the major aspects of agricultural statistics at the state level which I think should be emphasized. The title of my paper, "Senate Frontiers in Agricultural Statistics," sets up some definite boundaries for the things which we are to consider, which is always a good thing. It seems to me that we need to examine the following:

1. What are the most common problems and needs for agricultural data at the state and local levels?
2. If we can delineate the main needs and objectives, what ways are there of reaching them?

I shall try to limit myself to a few main issues which seem to be the major State frontiers in this work as I see them at this time, and they may be covered under the following heads:

1. A review of a survey recently made among state agricultural statisticians as to what they find is needed in the work for their states, and a listing of those items to which they would give priority if new resources were available to lay out additional work. I am indebted to Mr. Ebling to the Statistical Department of the State of Wisconsin and to Mr. Surratt from my own state for making available for my use the results of this survey.

2. What sort of program of service seems to work out in states where the work has developed farthest from the standpoint of meeting these state and local needs in agricultural statistics?
3. What are the opportunities for additional work in this field under the new Federal Research and Marketing Act, any longtime program of which must eventually rest to a considerable degree upon primary data on production and marketing in agriculture?

A Survey of What States Want

In order to get the views of informed individuals in different states as to what statistical data are most needed and which types of projects would be given priority if resources were available for extending the work, an inquiry was sent to state agricultural statisticians in June of this year. Twenty-four states¹ replied to this inquiry, and the replies received showed a great deal of agreement on certain major items that seem to be wanted in most states.

All of the states replying to the inquiry stressed the need for a greater development of county estimates and of programs to more fully meet the growing needs for local statistics. Generally these expressions were for more county and even township detail. To be sure, this need for sub-state breakdown of agricultural data does not take the same form in each state. In some states the need for local data is by irrigated and non-irrigated geographic areas; in others, local data are needed by uniform producing areas, but the striking thing is the widespread character of the demand for local data. In fact, this seems to be the most primary need in all states responding to the inquiry. From this it can be assumed that the problem is general and that at best in only a few states has it been adequately met up to now. Even in states where relatively good county data are available some extension of them would probably occur if more resources were available.

Another item for which practically all states expressed a desire was more analytical work and more interpretation and analysis of material already collected. It has long been recognized that more statistical material is collected than can be fully processed, but with the overload of work in state offices there seems to be a chronic problem in the lack of resources for analysis and interpretation of

¹ The following agricultural statisticians replied to the inquiry: A. E. Anderson, K. D. Blood, C. J. Borum, D. O. Boster, H. M. Brewer, A. C. Brittain, L. M. Carl, V. C. Childs, F. Daniels, O. M. Frost, E. L. Gasteiger, S. J. Gilbert, R. L. Gillett, C. J. Heltemes, M. M. Justin, G. Knutson, S. T. Marsh, F. Parker, E. C. Paxton, F. K. Reed, R. C. Ross, G. A. Scott, A. J. Surratt, and H. M. Taylor

data from the standpoint of putting them more completely into use. Output of available material in published form or otherwise is one of the important functions in agricultural statistics which has been inadequately performed because of lack of resources and trained personnel.

Among the items of new information that were listed as being wanted in the states, the following stand out in the order of importance:

- More county estimates
- More Livestock disposition and marketing data,
- Greater detail on market movement of crops
- Extended coverage to minor crops
- County farm income estimates
- Feed crop balance estimates
- Expanded price work
- Fruit trees surveys
- Irrigation and non-irrigation breakdowns

From the items listed it will be seen that the greatest emphasis is given to items dealing with county and local data. It is recognized, of course, that in some states a considerable amount of county material is now available on such things as crop acreages, crop yields, and estimates of production, as well as county inventory estimates on livestock numbers, etc. Even in states where this work is rather far along the demand seems to be for its further extension above everything else. As is to be expected, there is some geographic variation in the types of things that the states want most. In the Corn Belt, there is the emphasis on livestock data, in some of the Great Plains and Mountain States the emphasis is on both grain and livestock data, also dividing irrigated and non-irrigated crops with separate estimates for each by counties; and in some areas such things as fruit and vegetable crop receive very high priority because of the local importance of the items.

Another question asked in the survey concerned the priority which would be given in various items of work in the different states if funds were available for expanding the program. The states replying listed the following as the most important ones in the order given:

- Annual state publication (commodity or county series, historical data, and current data).

Further development of county estimates of crop acreages, production, livestock numbers, etc
 County estimates of farm income. Improved State-Federal balance in relations
 Assessors' annual farm census.
 Improved present coverage to fit individual state needs.
 Marketing statistics—livestock and crops.
 Develop better check data and market records.
 Fruit tree age and variety surveys

This list again emphasizes the extraordinary demand for material by counties. In practically all states, if the men had an opportunity to expand the work they would give this phase first priority. Because of the enormous growth of agricultural planning and other work and organizations at the county level, the demands for material at this level seem to be the most general and the most pressing of all. Again, one notes that there is some geographic variation in items farther down the list depending upon the things that are of first importance in the different areas, but there can be no doubt about the virtually unanimous agreement that first priority for new work lies with providing increasing amounts of local information, such as by counties.

What Can We Do About It?

It is one thing to show what is wanted, but how can we meet the situation? Perhaps by looking over the record we can get some of the answers from what has been done—both nationally and in those states where the work is farthest developed. The history of the work in agricultural statistics, especially during the last thirty years, is well known. For a long time it was mainly a function of the federal government centered in Washington. About the time that agricultural extension work was established through the Smith-Lever Act the work in agricultural statistics was partly decentralized by the establishment of state offices. This movement was in line with the trend of the times—a movement of agricultural functions from the national levels to state and local or county levels.

Beginning in Wisconsin in 1917, cooperative work was established between the United States Department of Agriculture and most of the states. While a number of states were independently doing some work in agricultural statistics prior to this time, many more have developed it under the cooperative arrangement with

the federal government. This had many advantages, one of the major ones being the degree of standardization of the work which was possible among the states because of the help of the federal agencies and of the standardized needs of the United States Department of Agriculture for the data it required at the national level. It resulted in the well-known methods of handling data on crops, including acreage, yield, price, etc., and similarly data for livestock.

On major items a good deal of standardization has been developed for all states because of the emphasis of needs at the national level and because the professional personnel employed has been mainly on federal civil service. Professionally, this has done much for the service, and what standardization we have by states we owe largely to this development. Some states already have come a long way in building up a good standard of service and wide coverage. Even so, much more coordination and standardization of the work among the states is needed.

The difficulties which one faces when he tries to get and compare factual material in the different states or for subdivisions of states must be well known to the members of the Farm Economic Association. In some states data are quite easily available and in good order, while in others much that is wanted is only partially available or not available at all. Even in such things as state farm price indexes, where available, there are often questions of comparability of one state with another. From the standpoint of greater utility I hope that similar material similarly prepared will be available before many more years in the reports issued by states, also that all agricultural leaders and organizations will cooperate to this end. A word of commendation is certainly due the Division of Agricultural Estimates of the Bureau of Agricultural Economics for the generally excellent influence which has already been exercised along this line.

We Need More Balanced Levels of Service

Quite logically the early work in agricultural statistics was largely a task of providing data at the national level. Getting data by states has often been merely a means of providing a basis for good national totals. The census, for example, has for a century collected data which could be summarized by townships, by counties by states, and nationally. National totals appeared as a first

objective and the state totals which accumulate to national totals as a second objective. Needs at the national level are quite well met, and on many items they are likewise well taken care of at the state level. However, when it comes to data by subdivisions of states, particularly counties, the development between states varies greatly and in general the needs of this entire level are still unsatisfied. Yet one of the major needs for the standpoint of state work is found here.

It is true, of course, that various data are published for the census years by counties, and also there have been some attempts to publish certain items by townships. Nevertheless, it is clear that while for a hundred years we have collected data in detail in the smaller subdivisions for transmission to distant places, only a small part of the local data was returned to the areas of origin for local use. To bring about adequate publication of available material in the subdivisions of states, and to integrate this material both over time and in terms of local geography, economy and history, I am sure, offers one of the challenges of our time.

The very nature of the problem suggests that it will have to be worked out largely in the states and it is gratifying to know that some good headway has been made on the job. It is also of interest to know that the Chief of the Bureau of Agricultural Economics is working with the officials in the Extension Service for the purpose of finding a way of achieving this task nationally. It requires a balanced program with adequate resources for each of the three levels of service—national—state—and local.

In some states the balance between the three levels of functioning and responsibility is much better than in others, but generally the local and state work is underdeveloped as compared with that at the national level. There is no doubt but that the states must assume the principal responsibility for developing the levels within their borders, but at the same time, one may well ask the question, "Is the U.S.D.A. pushing the matter enough to get the needed things done?" After all, good results at the national level must finally depend on the work in the levels below and the better these are developed the better should be the national position in this service.

The importance of breaking down our material by counties and often by townships becomes apparent when we note the increasing scope of activities of agriculture now being conducted in the

counties. The great growth of Extension work at the county level, educational work in the counties, government functions, farm and industry organizations, etc., point out the need. Extension work in the counties has long been organized on a project basis separately for each county.² As one Extension man put it, "It is difficult to run such county programs without factual material on the counties."

The types of data needed locally, usually are different from those needed at other levels. At the national level and often at the state level the matter of time series data measuring the current changes from month to month or from year to year are of greatest interest. But when we come to the local level, the emphasis changes. Here we have a greater need for data that show the geographic patterns within the county than for the latest figure showing the current changes over time. Changing patterns in the teaching of agriculture now also require local data before those for larger units such as the state or the country as a whole.³ Then too the demand for county agricultural statistics from industrial, transportation and financial agencies dealing directly or indirectly with farmers equals that from the agricultural industry.

There are over 3,000 agricultural counties in the United States. The state level task of dealing with so many units must have the financial support and backing of the state. It requires specialized knowledge of each unit as well as a capacity to prepare and organize data by counties into a logical sequence so that a story of each county will be known in terms of geography, local economics and history. Along with the primary problems of preparation of such material is that of keeping it up to date, which becomes an important and continuous project. It is encouraging to note that the need and value of this county service have been recognized and are gaining support in an increasing number of states.

Specialized Personnel Needed in State Work

It must be recognized that because of their varied geography and variation in agricultural production, not all states and subdivisions of states can be treated alike. The highly important

² For a full discussion of agricultural data needs in extension work, see a paper by C. D. Caparoon and E. A. Jorgensen, this JOURNAL, XXX, page 282.

³ For a discussion of this see "The Use of Agricultural Statistics in Schools" by Walter H. Ebling and Louis M. Sasman, this JOURNAL, XXX, Page 292.

standardization which has been possible because of cooperative arrangement between the state and the federal government has many advantages at both the state and national levels. Because the states differ greatly, a knowledge of a state's economy, its geography, and its history is quite basic to rendering those specific services within the state. Professional personnel in the field up to now has been mainly federal, and this has had real value in developing fairly uniform state level data for most states; but with the increasing decentralization of work and the greater recognition of needs within the states, we have reached a time when there is urgent need for more understanding of the internal characteristics of the states themselves.

In order to make the most of the opportunities which lie here the workers need to be well grounded in their knowledge about the state. The local variations in states present so great a challenge that to provide the needed data and their interpretations this kind of knowledge and understanding is necessary. To function properly, this local work must have resources for the job. There must be sufficient autonomy in the program so that it can be carried out independently, and there must be continuity of service.

It may be one thing to know the work as a national operation and perhaps quite another to know it as a function internally within a state. The broad knowledge of the state's agriculture as it is related to its entire economy, its geography, and its history comes only with time and experience. To some degree it can be met by college training, but most of it has to be learned on the job. For the purpose of broadening experience and promoting proficiency it has been the custom to move personnel from one state to another or to the Washington office with the result that much of the training in dealing with the local situations has been lost. Such personnel should be moved less frequently and moves should not be made without proper provision for the continuation of the work through the proper training of others. A balancing of staffs with at least a part of the personnel specializing in detailed internal knowledge of each state would seem to be one of the first essentials in making possible an adequate state program.

R & MA Opportunities in Statistics

From the standpoint of further developing and rounding out the agricultural statistics work in the states, the Research and

Marketing Act of 1946 is of the greatest importance. This Act establishes a long-time program of research in marketing of agricultural products. Already the State of Illinois has entered an agreement for work in this field, and our share of the cost of this work for this biennium is \$25,000.00. Any long-time program of this type must contemplate basic work in marketing statistics rather similar to the production statistics which are already quite well developed at least on a national and state basis. State departments of agriculture through their statistical offices have an opportunity to make an important contribution by combining the development of new data on marketing of farm products with the data already being brought together mainly on agricultural production. In fact some of the unfinished functions in the old field of work can readily fall within the scope of the new Act.

The rounding out of our service to agriculture so as to include new material on marketing will probably confront us all in the next few years. Because of this each state should give serious consideration to developing some broad projects under the new Act with the objective of providing the needed marketing data on crops, livestock, dairying, poultry and eggs. Programs will need to vary for the different states because of the relative importance of the different commodities. Certain types of marketing data should, if possible, run through the structure so that they will be available within reason for all parts of the country in which the commodities involved are important. The work under the Research and Marketing Act has to begin with projects set up in the states. However, it should look forward to a coordinated program of work rather than an unrelated aggregation of projects. The work on marketing data if properly associated with the existing activities in agricultural statistics in which we already have a considerable standardization, should coordinate more readily than most of the other phases of marketing work developed under the Act. It would seem that state departments of agriculture have here an unusual opportunity to develop a broad field of work in marketing data paralleling what has already been built in production data.

The administrators of the Marketing Act can well afford to invest a part of their funds in primary data on which the bulk of their projects must rest. In fact, it is hard to conceive of a long-run marketing program without such material as a firm and continued foundation. Those of us interested in agricultural statistics in the

states should welcome the opportunities presented under this new law. We should without delay establish broad basic lines of work and we should ask the federal agency to attempt some coordination of it among the states so that instead of a great array of projects we come early to a broad basic program of marketing data. We have in most of the state statistical offices enough experience and talent so that we can move boldly in that direction. The ends may be achieved by somewhat different means and even through different agencies in the various states, but the objective of data on the marketing of agricultural products at the farm as a part of this field should be staked out early and vigorously pursued. Already there are enough projects underway in states so that the framework can be discerned, and I would like to urge state commissioners of agriculture and the Bureau of Agricultural Economics to undertake a program of cooperative work in the development of the marketing data which will be needed under the RMA programs in marketing if these are to grow into the usefulness Congress has a right to expect.

To summarize, then it is my thought that the States should take the major share of responsibility in the field of agricultural statistics dealing with the preparation and publication of county agricultural statistics or sub-State breakdowns and entirely for assessors' farm census work. The practical value and expanding uses of these data within states are well known to this group.

I am indebted to the State statisticians in twenty-four states who cooperated in the recent survey which points out the outstanding needs for strengthening and extending the State and National service in agricultural statistics. It is clear from the results of this survey that county agricultural statistics and sub-State breakdowns are given top priority. It also stresses the importance of annual State publications and the need of extending other services to better equip State offices for meeting the expanding uses and calls for agricultural statistics. The preparation and publication of county and sub-State data vastly increases the amount of detail and time taking work. Our service possesses the "know-how" for expanded lines of work but our State offices, by and large, are understaffed.

Research and marketing programs initiated in the states but integrated nationally, offer an exceptional opportunity for expansion to the point where local and national needs for basic data

better can be met State resources provided for this purpose should be used mainly for state work.

The importance of local data should not be underrated at the National level. If observed this will strengthen the entire structure from the local to the State and National levels. In some states I feel that more attention should be directed to working out a more balanced program at these three levels. This will require skilled leadership. I feel that the U.S.D.A. is well equipped to share in the aggressive action needed to obtain improvement in standardization and service.

If I may conclude with a recommendation it will be that both the States and the U.S.D.A. make added provision for employing and training specialized personnel for this cooperative work. Also to maintain a balance so that the number of more experienced men are ample to carry out State programs without a break in the flow or efficiency of the schedule of service. The maintenance of a well informed and balanced State staff is certainly one of the first essentials to an adequate State program. Also I would recommend that both the state and National Departments of Agriculture canvass more vigorously R.M.A. possibilities for broadening and improving our fields of public service, particularly the needed service emphasized in the returns from the state survey, and also to provide the marketing data which will be essential to the long-run success of the R.M.A. Act.

DISCUSSION*

R. K. SMITH

Bureau of Agricultural Economics

Being a statistician it is natural for me to start by giving a few figures as a background to later discussion. The Bureau has 41 State statistical offices which serve all of the 48 States. In 40 of them formal cooperative agreements are maintained with State Departments of Agriculture or State Colleges of Agriculture, or both, for the collection and publication of agricultural statistics. In 7 States the cooperation is limited to statistics on manufactured dairy products. Of the remaining 33 States, the Bureau cooperates with the State Departments of Agriculture in 28 and with the State Colleges in 7. With the programs developing under the Research and Marketing Act, agricultural agencies in a number of additional States have become interested in strengthening the statistical work at the local level

* A discussion given at the Annual Meeting of the American Farm Economic Association, Green Lake, Wisconsin, September 13, 1948.

as an aid to marketing programs. It now appears that such agreements will be completed in at least 3 additional States within the next few months.

In total, the States put about \$470,000 into these cooperative offices last year—the amount ranging from less than \$1000 in some States to \$85,000 in California. Other States making important contributions to the agricultural statistics program are Wisconsin, Illinois, North Carolina and New York. As Mr. Benson has stated, this cooperative work started back in 1917. The purpose of these cooperative agreements between State and Federal agencies was to eliminate duplication in the collection and publication of agricultural statistics at the State level; to provide a coordinated program of State and national agricultural statistics; and to make it possible to provide better local information such as county estimates. Over the years this cooperation has been highly effective and at the present time there is practically no duplication between State and Federal agencies in the collection and publication of agricultural production statistics. This program has also resulted in the desirable standardization of statistical work mentioned by Mr. Benson. It is providing much more information at the local and State level than would be possible with each agency carrying on a program alone. In the States where agreements are in effect I believe also that they have resulted in a stronger State statistical program as well as adding greatly to the national program. After all, many of our national statistics on agriculture are built up on an individual State basis and a strong State program means greater strength at the national level.

These cooperative arrangements have always recognized the State responsibility for information at the sub-State or local level. For the most part, it will have to remain a State responsibility and the volume of local data made available will largely depend upon the amount of support which the individual States can provide. Some further standardization in agricultural statistics for sub-State areas may be possible. This can probably be best accomplished, as it has in the past, with the Washington office acting as a coordinating unit providing for the interchange of ideas, results of research carried on in the various States, and new methods developed, as well as general technical and counseling help. However, local needs vary by States and even within States. Thus state needs are an important factor in determining what each State shall do for the money it puts into the collection of agricultural data. To meet the needs expressed generally throughout the country the Federal Bureau is anxious to give all the assistance it can in the development of local data, provided that States want such help.

Strengthening of the Field Offices

The Bureau has long recognized the need for strengthening the State statistician offices not only to do a better job on the agricultural statistics now being provided but in meeting additional or new needs. Even with some increases in appropriations for the statistical work of the Bureau these increases have not kept pace with increase in costs and usually such increases have carried with them commitments to carry out new lines of work. We find it difficult to drop lines of work because the interests which

were instrumental in providing for a line of statistical work insist that it be continued

In a recent survey among our State statisticians on the needs for strengthening the offices, each office was asked to list the kinds of data now collected which needed to be improved or expanded. Thirty-seven of the 41 offices listed as first priority the need for improving or expanding the entire program of county statistics. These replies emphasize the point that Director Benson has made regarding the need for county and sub-State data. A wide range in the types of county and sub-State data seems to be wanted in the different states. While the Federal Government has provided funds since 1933 for preparation of basic county statistics on acreage, yield and production of such crops as wheat, cotton, corn in commercial corn areas, rice, flax, etc., which were needed in the administration of adjustment and crop insurance programs, the development of most county statistics rests with the States. The State men reported a wide range in the types of county statistics requested.

While the program of county estimates was given top priority by the State Agricultural Statisticians in the kinds of data now collected which need to be improved or expanded, there were also other types of information wanted and I am sure this group would be interested in a list of them. The following are the more important ones in the order of frequency of mention.

- Prices received and paid
- Livestock numbers and production
- Marketing data on crops and livestock
- Truck crops for fresh use and processing, including market gardens
- Release and publication of data already collected
- Expanded information on fruits and berries including number of trees, production and utilization and value by varieties and age groups
- Expanded poultry program including broilers, eggs, turkeys, etc.
- Utilization of farm products
- Production, utilization and value of dairy products

It will be noted that most of the important statistical series now being issued were mentioned as needing improvement in at least some States. The fact that release and publication of data already collected was mentioned frequently emphasizes the importance of sufficient resources to interpret, analyze and publish more of the statistical material already collected. Generally these needs can only be met by securing additional resources.

Specialized Personnel

This leads me to the matter of personnel. Director Benson has mentioned the need under an expanded program providing longer tenure of experienced technical help in the individual State office. The Federal agency recognizes the value of experience and knowledge of agriculture in a particular State when working on problems dealing with that particular State. Under a growing Federal program with much of the technical personnel under Federal Civil Service it has been necessary to move such personnel in accordance with requirements of the over-all program. This has been

one of the factors leading to standardization and has given each individual a chance to gain experience and advance more rapidly than would otherwise have been possible. It has also given them a fuller appreciation of the national program

Opportunities under the Research and Marketing Act

It seems that the Research and Marketing Act of 1946 offers opportunities for expanding the agricultural statistics—not only at the State level but also at the local level. Practically every marketing program which is set up requires basic agricultural information either on production, supply, market outlets or some other category which is of importance in solving marketing problems. A number of States have already taken advantage of such funds in expanding their program in agricultural statistics by developing marketing data. Such cooperative RMA projects are in operation approved in 9 States. These cover such projects as:

- Collections, tabulation and dissemination of statistics relating to fruits and vegetables on less than State basis.
- Estimates of number of sows farrowed monthly.
- Developing methods for forecasting monthly marketings of hogs.
- Number of fruit trees by varieties and age groups.
- Developing series of monthly and season prices for principal apple varieties.
- Development of more complete statistics on poultry at the State and local level.
- Development of primary statistics in milk production, utilization and marketing at the farm by local market areas.
- Study of basic trends in commercial production and marketings of fruits and vegetables and processing crops by areas.
- Sources, markets and marketing outlets of livestock by counties and market areas.
- Survey of grain storage capacity survey on and off farms.
- Development of statistics on prices received by farmers for agricultural products, particularly wheat, beef cattle and eggs by classes or grades and by local areas.
- Survey of capacity of alfalfa dehydrating plants.

As mentioned earlier the availability of RMA funds is expected to lead to cooperative agreements on agricultural statistics between the Bureau and State Agencies in at least three additional States. Those charged with the responsibility of administering RMA funds are interested in expanding the work with the State Departments of Agriculture into additional States and this offers many opportunities. Here again the matter of standardization is rather difficult because of varying demands among various States. The Bureau is glad to give what assistance it can in developing the statistical program under the RMA Act, and is particularly interested in seeing that certain broad objectives are carried out in State projects and the type of projects undertaken. The Bureau has also assisted in setting up and developing methods for carrying out some State projects undertaken with RMA funds. However, funds which are allocated to the State Departments of Agriculture for matching under the Research Marketing Act become essentially State funds and the primary responsibility for their expenditure rests with the State agency, and the State statistician in charge of the joint office represents the State in carrying out RMA projects assigned to him.

The Bureau in its requests for RMA funds at the national level for the collection of statistical data needed in marketing research has followed the policy of recommending projects which round out programs of a national character such as data on stocks of flaxseed and sorghum grains, naval stores and broiler supplies in commercial areas as well as recommending programs in new fields where research is necessary to determine the most effective means of collecting needed information.

The importance of the RMA Act in developing marketing data to parallel production data is recognized. Undoubtedly some coordination may be needed in Washington and much more will be needed in the States. In the States it is evident that much public relations work lies ahead to develop concentrated interest in some subjects. At the present time our field offices vary considerably in their capacity to develop and coordinate these various group interests, and the available experience in such offices needs to be exchanged. I would also like to emphasize the necessity and desirability of any agency planning a research project to carefully review the field of available basic data on the subject, if the needed statistical information is not available, provision should be made in the project to collect it. In the past year some RMA projects were started without full knowledge of the limitations in the basic statistics available on the subject. Consequently there have developed urgent requests for statistical information which cannot be met with existing resources. It is also just as important that existing data are not duplicated.

In closing I want to suggest that the Bureau through its State offices and with its coordinating technical group in Washington is in a position to render assistance in developing methods for collecting additional agricultural data and in the compilation and publication of such data. In other words, the technical skill and the "know-how" is generally available if the necessary resources can be provided.

ROUNDTABLE ON FATS AND OILS

Chairman Oscar A. Day, Wilson and Co.

OUTLOOK FOR WORLD FATS AND OILS PRODUCTION AND USE*

W. H. JASSPON

Perkins Oil Company

AFTER World War I the opinion was widely held by Government experts that fats and oils would continue to be scarce—and high—for many years. Within a few months following the 1919 bulge prices declined violently. A high official of that era, when asked to explain what happened, stated simply but realistically, "We underestimated the ability of the people to do without." Is history repeating itself?

Statistics continue to show a mathematical gap between world supply and demand. Many predict again it will take years of high prices to bring about a balance. No one denies that there is a dietary deficiency in many parts of the world. There always has been. It is agreed that population is increasing. Against these arguments, when it comes to assessing price trends, it is necessary to weigh the incentives of price and recovery as influences on increased production. Nor can we ignore the cruel fact that most large consuming nations cannot afford to purchase fats freely, even if extra quantities were now available.

For many years before World War II, fats and oils were relatively cheap. There was no occasion for conservation. Used fats were seldom saved for reuse or sale. International trade was comparatively easy, and low prices induced large inventory accumulations.

It is appropriate to examine the changes which are taking place in the world pattern. It may be too early to evaluate their ultimate impact on our own new pattern of production. We shall have to find export outlets if we are to produce at current capacity.

The Philippines have more than restored their prewar position as producers of copra. Credit for the rapid resumption of this trade is due primarily to the organized activities of a group theretofore engaged in the business. They created a non-profit development corporation, with the approval of, and aided by, the U. S. Gov-

* A paper given at the Annual Meeting of the American Farm Economic Association, Green Lake, Wisconsin, September 14 1948.

ernment, which provided the implements of rehabilitation. It is an excellent demonstration of what experienced people can do. While several hundred thousand tons were lost as a result of a typhoon in late 1947, full-scale production may again be expected during the coming year. Other areas of the Orient and South Pacific have not made such progress due to political disturbances, as well as price and marketing controls, all of which have retarded all-out activity.

India was a primary source of export supply before the war. The tendency there, as in many agricultural exporting nations, is to industrialize and channel an increasing share of the products into home consumption.

Argentina calls for more elaborate explanation. It has been one of the lowest cost producers of cereals and oilseeds, principally flaxseed. It supplied a major part of the world's linseed requirements, prewar. Its export price set the world's market. The United States was dependent on such imports, which averaged around 18,000,000 bushels annually in the 1935-39 period. However, in 1946, the Central Bank, aware of world shortages, and being dissatisfied with its position during the war, took over under a decree practically all of the exportable agricultural production of field crops. It became, in effect, the sole buyer. It fixed a price to the producer of about \$2.26½ per bushel in terms of the U. S. dollar, for flaxseed. The exportation of flaxseed as such was prohibited. A National Agency became the sole seller. It set price levels at an all-time high, which influenced prices throught the world. This State operation, until recently, provided huge and quick profits. But it served notice to the world that Argentina could not be relied upon as a primary source of supply, as long as it exercised a dictatorial State control over exports and prices. Unless its present policy of a State controlled economy is reversed, the effect will be a permanent impairment of its basic economic system.

Until very recently Argentina has shown no disposition to change its arbitrary price policy. Inventories have been permitted to pile up without regard to the possibility that Argentina could no longer dominate the market. The present stock of linseed oil there is estimated at 150,000 metric tons. There are also some export stocks of edible fats and huge quantities of oil cakes, all owned by the trading agency. Many linseed mills have ceased to operate because no further storage is available. Planters have been urged to cut the

flaxseed acreage in 1948 even further, in an attempt to extricate the Government out of the full consequences of its ill-advised venture into the commercial field. Prewar acreage was around 7,000,000 though in 1936-37, over 8,500,000 acres were planted. Production this year is about 850,000 metric tons on slightly over 4,000,000 acres, though over 2,200,000 tons of flaxseed were harvested in a single year (1931-32). Price does influence production.

There have been further effects of its state-planning policy. It compelled the United States to become a self-sufficient producer. It induced Canada and Mexico to increase production for world markets. These efforts have been so successful that these three countries will have substantial surpluses for export this year. The Argentine policy has been the direct cause of a flaxseed program in French North Africa. England has begun to grow flaxseed on a commercial basis. Even smaller countries, like Sweden and Denmark, have undertaken to grow flaxseed for crushing. This approach to national self-reliance is against the interest of a sound international trade economy. It forces governments into underwriting unnatural and high-cost production. But until Argentina accepts the doctrine of dependable large-scale production and free marketing the present trend will continue.

By this time bountiful harvests here and in Europe must have impressed the Argentine officials that they have over-played their hand. The press reports some criticism because of our refusal to grant dollar credits through ECA for the purchase of Argentine surpluses. The British, and other countries to a lesser degree, bailed them out in 1946 and 1947, under stern necessity. Now they want to high-pressure us into rescuing them from their self-made dilemma. This is too high a price to pay for goodwill. Argentina can earn dollars legitimately when it resumes its natural competitive position for the U. S. market. Regardless of representations from diplomatic sources ECA cannot justify the allocation of funds to buy commodities in other countries when they can be procured here. I view with some misgivings its recent allocation of dollars to European countries to purchase oil cakes in other Latin and South American countries, when we will be confronted shortly with a domestic surplus.

Argentina may decide to sell its present stocks to Europe in the near future, either through credits or in the currency of the country. It cannot hold out indefinitely.

The over-all fats and oils position in nearly all European countries shows improvement. European nations having colonial possessions control their exportable supplies. In some colonies open dissatisfaction is quite pronounced over the low prices paid to them as compared with prices paid heretofore in free markets. It has interfered with maximum output. The production of whale oil has reached the level permitted by international convention.

England has materially added to its stock pile from the low of 1946, despite an increase in its fat ration of one ounce per week within the past year. Empire harvests, coupled with supplies from sterling areas, should be sufficient to obviate the necessity to allot ECA dollars for the purchase of fats and oils.

The French stock is low, and France will have to be a claimant on free supplies for about one-third of its current ration. It has made some progress in expanding production, in addition to flaxseed. It expects to provide about 35,000 tons of oil from rapeseed grown in metropolitan France this year. Rapeseed was not produced in quantity for many years prior to the war. The Germans induced its cultivation during the occupation. Since the war, high oil prices and lack of exchange have made it attractive to farmers to grow this crop. A peanut project is being proposed for French West Africa.

England is at work on a similar development for British West Africa, and a huge peanut acreage is being readied in British East Africa. While progress has not been as rapid as anticipated, full-scale operation is expected by 1952, to yield between 250,000 and 300,000 long tons of oil annually at that time.

European livestock rehabilitation at an accelerated pace is assured by excellent feed crops. Large tonnages of proteins will also be available. The question is, how much can they afford to purchase.

Brazil is another area capable of expansion in oilseeds. In the North, babassu nuts (a species of palm) are in vast supply. Large-scale operations were held back, before the war, by the then prevailing low prices. The lack of a cheap and efficient nut-cracking process, the need for good roads and transport equipment are also important factors. But if the price incentive is sufficient, these technical and mechanical difficulties will be solved. In Southern Brazil the peanut harvest this year is estimated to yield over 200,000 tons, as compared to about 20,000 tons in previous years.

Practically every importing and exporting country maintains state controls in varying degrees. Such restrictions, coupled with the lack of confidence in the official rates of exchange for the currencies of many countries are handicaps to full recovery. Bilateral or barter deals stem from these causes. This makes it difficult and often unrealistic to translate stated prices in terms of the dollar.

The United States, according to present estimates, will produce a much larger exportable surplus of fats from 1948 crops. Lard production should also begin to increase by the end of first-half 1949. Unless producers are to receive unexpected low prices especially during the heavy marketing period, except where the support prices are high, as in the case of flaxseed and peanuts, it is essential that a realistic program for export be formulated and approved without further delay. The bulk of such exports will have to be financed by ECA funds. A large quantity will probably be requisitioned by the Army for occupied areas.

Except for the possibility at this time of low prices, the various nations participating in the Marshall plan will request minimum supplies of fats and food items, as there are many claimant agencies in each country who require dollars for other goods and materials. It is likely that the aggregate requirements (including the Military areas) can absorb whatever fat surplus may be offered by the U. S. However, it is doubtful if Europe will require the prospective world surpluses of oil cakes, unless the price is so low that they may consider its use as a fertilizer. Recently the Food Director of ECA expressed the opinion that larger cereal exports were possible in view of the increased crop estimates. (I assume he would take the same position with respect to fats and oil cakes.) The Secretary of Commerce issued a statement as being opposed. He wanted the consumers here to have a "break." He was either unaware, or deliberately overlooked the fact, that the day he used this springboard in an obvious bid for votes, both wheat and corn, new crop, were selling below the minimum prices the Government guaranteed producers. The Department of Commerce should not have the legal power to veto an export food plan initiated by the Department of Agriculture. It does not make sense, and the law giving Commerce this right should be revoked by Congress.

My purpose in highlighting some of the forces at work in the world is to focus attention to the price problem confronting producers of oilseed crops here, and to the need for the Government

to formulate a practical policy, first, concerning the disposition of the surpluses arising from this year's production; and, second, to create a sensible program as to what it proposes to do about the 1949 production. Obviously one has a distinct bearing on the other.

For purposes of discussion, I shall make several suggestions in connection with our domestic situation

1 I believe it is sound, at least for another year, to encourage oilseeds production. At this time, it is fair to assume that oilseeds in 1949 are more likely to be in greater demand than the additional tonnages of cereals and feed crops, which would be grown on most of the acreage withdrawn from oilseeds. We must insure our own needs, and can afford to insure some of the world's requirements at reasonable support price levels.

2. The Government should have the courage to allocate exportable quantities, *before* these surpluses pile up as they have in Argentina, or sell at unduly low prices. Large stock piles are an unnecessary burden, as long as production is encouraged. The producer, processor, and ultimate buyer are all entitled to know what demand they can expect *in advance* of heavy seasonal marketing, as long as Government exercises controls which restrict free trading.

3. The whole question of export controls should be re-examined objectively. There is ample justification for relaxing controls or limiting them to special conditions. In many commodities they may be eliminated entirely. As I have already stated, the greater share of exports is already controlled by dollars set aside by ECA. We should not limit or regulate imports by our Latin American neighbors, who are our regular customers. It is time to demonstrate our professed faith in freeing trade, not in freezing it. It is wrong to use either the allocation or power veto to impose in effect a form of price control.

ANIMAL FATS AND OILS—SITUATION AND OUTLOOK*

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THE animal fats and oils outlook is of vital importance to livestock producers as well as to the entire livestock and meat industry. It is also of real interest to producers and processors of competitive fats and oils, and to the general public, as a factor in their cost of living. This paper (within the space limits available) will take up (1) the current animal fats and oils situation, (2) the probable situation in 1949, and (3) the outlook for the next decade. Emphasis will be placed upon the long-range outlook, with special consideration of the major favorable and unfavorable factors that may affect the *relative* supply and demand situation for animal fats and oils in the 1950's.

Current Situation

The wholesale price index of 27 fats and oils currently (August 1948) is 18 percent below the peak in January 1948, but it is still about $2\frac{1}{2}$ times the levels which prevailed during the immediate prewar years (1939-41). Inedible beef fats show the least advance over prewar (about double), butter has advanced about $2\frac{1}{2}$ times, while prices for edible beef fats and lard are slightly more than triple the 1939-41 average. During this same period the wholesale price of all foods advanced about $2\frac{1}{2}$ times, while the all commodity index is a little over double the prewar level.

Consumption of the four major edible fats—lard, butter, shortening and oleomargarine—in 1948 will be about 38 pounds per capita. This is about the same consumption as last year, but it is about 5 pounds less than the prewar (1939-41) average per capita consumption. Lard consumption in 1948 will be about 12.5 pounds per capita, which is about 7 percent less than prewar (1939-41). Butter consumption is expected to be about 10.2 pounds per capita this year, or nearly 40 percent less than the prewar average. This reduced per capita consumption of animal fats

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is largely a reflection of the sharp drop in production, especially of butter, and the increase in population over the prewar period.

Outlook for 1949

On the supply side, the outlook for fats and oils in the coming year is dominated by the exceedingly favorable crop conditions which have prevailed during the present growing season. Not only will the 1948 crop of vegetable oils exceed the previous crop by a wide margin (about 19 percent), but once again we have an abundant supply of feed grains in prospect for increasing livestock production and the output of animal fats. The protein supplement derived from the oil seed crops also will aid in the expansion of the livestock production which will follow this year's bumper harvest.

Of course, livestock numbers cannot be expanded immediately. There even is some question as to whether or not the downward trend in cattle numbers will be halted by 1950. However, it is quite certain that more grain will be fed to beef cattle and milk cows in 1949 than during the current year, and this should mean a greater output of beef fats and of milk. The prospects for butter production in 1949 is an interesting question. With probably somewhat more milk and smaller foreign demands for milk products, one might expect a considerable increase in butter production next year. However, if consumer purchasing power continues at or near its present high level, it seems highly possible that this increase in total milk availability could easily be absorbed in increased consumption of fluid milk and ice cream.

Although hog production certainly will expand in 1949, hog slaughter in the coming marketing year (beginning October 1) already is largely determined by the size of the 1948 pig crop. Total slaughter in 1948-49 may differ very little from the preceding year, but weights to which farmers feed hogs may be quite heavy, because of the abundance of feed and expected favorable feeding ratios. We estimate that next season's lard production may total a little larger than in 1947-48, but production of all animal fats will be off slightly from a year earlier.

The demand for domestic fats and oils in 1949 is, of course, closely tied to the general business situation and consumer purchasing power. As yet there are no signs of a material weakening of these factors, at least through the first half of the year. The sharp increase

in the production of vegetable oils will make possible increased output of manufactured products competing with animal fats. Moderately larger imports of tropical oils may also materialize in 1949, although the entire export-import situation for fats and oils is dependent upon future Government policy in this field. The Government should be taking steps (thinking in terms of long range policy) to encourage or at least permit the development of export markets for United States fats and oils. This is especially important because of the potential large supply of animal fats as our meat production increases.

The Long-range Outlook

A comprehensive statistical evaluation of the long-range outlook of animal fats and oils is beyond the scope of this paper. An effort has been made to outline some of the major *favorable* factors affecting the *relative* supply and demand for animal fats compared with vegetable oils (pros), and to some of the major *unfavorable* factors affecting the *relative* supply and demand for various animal fats (cons) during the next decade 1950-1960.

Needless to say, the *absolute* level of lard prices will hinge importantly upon the total supply of all fats and oils, including imports and the multitude of factors affecting the general level of prices, employment and business activity, as well as the 10 percent increase in population expected by 1960. For the most part, I have only generalized, and no generalization can be more than a partial truth. It is hoped, however, that the points listed will serve to stimulate additional interest in further research in this important field.

I. *PROS* (factors tending to *strengthen* the relative supply and demand position for animal fats).

1. *Improvement in the nature and the adaptability of animal fats.*

One of the most startling and most recent developments in the field of improving animal fats is the discovery of new antioxidants which improve the keeping quality of lard. One such new product, known as AMI 72, and developed by the American Meat Institute Foundation, at the University of Chicago, when added to lard protects products such as potato chips, crackers and pastries from rancidity on grocery store shelves and in the home, for a period much longer than heretofore has been possible. It also has the fortunate charac-

teristics of being readily fat soluble, easy to add to lard, requires no special equipment, and is inexpensive, adding only a fraction of a cent a pound to the cost. The antioxidant also greatly increases the keeping qualities of lard itself. When kept at room temperature and exposed to air, the keeping time of lard by the use of AMI 72, was increased from a period of 4 months to periods ranging between 26 to 31 months. This development, along with the research work which has resulted in the modification of the physical properties of lard by either adding lard flakes or by partly hydrogenating the entire lard, and permitting its mixture with vegetable shortening, is an extremely important one which should strengthen the relative position of lard over the next decade. It will permit the use of lard in the rapidly expanding "mix" field. When this important stride forward is combined with the trend toward a better and more convenient package and more aggressive merchandising for the home market, as now seems probable, we will have to list our first point as one of the strong plus factors on the side of this important animal fat.

It is my understanding that parallel developments for butter are under way, which should result in a further improvement in this other major animal fat product.

2. *Increased emphasis on lean hogs and lean beef.* Experimental work at various colleges and on the part of animal breeders is resulting in slow but sure improvement in the type of hog that, when marketed at light weights, will give an increasing proportion of the more valuable cuts, hams, loins and bacon, and a decreasing proportion of lard. To some extent, this is being aided by the increasing supply of the high-protein soybean oil meal, increased use of better legumes and grasses, and more emphasis on soil conservation. Further progress should be made in the next ten years in the development of a higher protein corn. In fact, it seems clear that the increased emphasis on leaner hogs and perhaps leaner beef will, in part, be stimulated by the relatively unfavorable position of animal fats themselves. It is a well-known fact that the average weights to which hogs are fed affects importantly the supply of lard and fat cuts. Due to this fact, and the fact that the average amount of feed required per pound of gain increase directly with market weights, it has been shown that a normal supply of feed (88 billion pounds of corn equivalent) when fed to hogs weighing 200 pounds, would result in 9.3 billion pounds of lean pork and 2.6 billion pounds

of fat. This same supply of feed, if fed to hogs averaging over 300 pounds, would give 7 3 billion pounds of pork and 5 1 billion pounds of fat ¹

3. *Strong European desire for animal fats.* With the world population increasing at an annual rate of 20 million persons, reduced livestock numbers in Europe, and relatively low consumption of fats in many countries, there is no question that a strong desire for some of our animal fats exists abroad. The basic problem, of course, is: What will we take in exchange for these commodities? It is not a question of world needs, but a question of whether or not foreign countries will be able to pay—and this looks none too hopeful. It is understood that many countries, especially European countries, prefer lard which (to the extent that they have purchasing power) should favor the relative position of this animal fat. It will be recalled that just a year ago, the FAO concluded its discussion of the European fats and oils situation with the following statement. "The low level of fat production in Europe, combined with the acute world shortage of fats, is responsible for a serious decline in fat consumption in Europe, compared with pre-war, than perhaps in any other food" ²

Also, in his recent testimony before the Senate Committee on Banking and Currency, Secretary of Commerce Charles Sawyer emphasized a continued world shortage by saying "World demand for fats and oils continues to be greatly in excess of supply. Before the war, world net exports of oilseeds, butter, oils and fats, averaged 5 8 million metric tons annually (fat equivalent). This amount was reduced to 3 45 million metric tons in 1947, and a favorable estimate indicates that about 3 8 million tons may be available for international trade in 1948. Without allowing for increased world population, the present international trade in fats and oils results in a deficit of about 33 percent"

4. *Aggressive research in the direction of developing industrial usage of animal fats.* The possibilities of industrial use of fats is a topic that is so new that no definite conclusions can be drawn. Research to date has indicated that the breaking down of fats into their various components might open up an entirely new use in plastics and other synthetic fields. To some extent this develop-

¹ Source: *Feed Consumption and the Production of Pork and Lard*, Technical Bulletin No. 917, June 1946, United States Department of Agriculture.

² The State of Food and Agriculture, FAO Conference, August 1947.

ment would eventually apply to all fats, but in the interim, it appears that animal fats would receive the greatest benefit

5. *Possibility of stock-piling animal fats* This possibility arises basically out of the new technical developments referred to in (1) above, which permits greatly increased keeping quality of animal fats, and may be stimulated during some period within the next ten years by the pressures arising as the result of the attempt to support hog prices. The Government may justify such a program on the grounds of National Defense, since it is true that the storage of fats requires little space relative to the number of calories involved, and that fats have considerable flexibility from the standpoint of mobility and usage during a period of emergency. It is significant that coconut, palm, and tung oil are among the list of strategic and critical materials listed for national stockpiling by the Munitions Board

II. *CONS* (factors tending to *weaken* the relative supply and demand position for animal fats).

1. *Downward trend in the relative price and relative consumption of lard as compared with shortening over the past 25 years.* The total consumption of lard and shortening per person in the United States has tended to be fairly constant over a period of years. Our study shows that lard production tends to fluctuate up and down depending upon the size of the pig crop, and feed conditions, which in turn, along with the declining export market, has affected its domestic consumption. Shortening production tends to take up the slack. However, since 1920 in spite of a definite downward trend in lard consumption, as compared with shortening, the relative price of lard to shortening has dropped at the rate of over one-half percent a year. This progressive loss of favor of lard, compared with shortening was shown by Dr. A. B. Paul of the University of Illinois,³ and is confirmed by our own study. This means that consumers are not as easily attracted away from shortening by falling lard prices as they used to be. Therefore, if this pronounced trend continues, even at a more gradual rate, increasing supplies of lard will result in even greater relative discounts compared to shortening over the next decade.

³ *The Changing Character of Shortening Products*, Dr. A. B. Paul, Illinois Farm Economics, November, 1947.

2. *Downward trend in the relative price and relative consumption of butter as compared with margarine in recent years.* There has been a similar downward trend in the relative consumption of butter as compared with margarine over a 25-year period. This trend has been accentuated in recent years by the high domestic consumption of milk, cream and ice cream, and exports of dried milk and milk products, which has decreased butter production. In contrast to the unfavorable lard-versus shortening price relationship, the trend has been upward in butter prices relative to margarine, until very recently. However, within the last two years this price relationship has shown a sharp drop indicating an increased acceptance of margarine relative to butter. It appears that butter producers may have to adjust themselves to a new level of relationship between butter and margarine. This will be especially true if the proposed removal of the Federal tax on margarine becomes effective and if butter supplies show increases over present low levels.

3. *Downward trend in the relative price of inedible tallow as compared with coconut oil.* Our study shows a definite downward trend in the price of inedible tallow relative to the price of coconut oil and other foreign oils. This appears to be largely the result of an increasing supply of inedible tallow and grease, which has nearly doubled since prewar. The trend in inedible tallow and grease consumption, when compared as a percentage of the total fats and oils used in soap, is distinctly upward. This suggests that inedible tallow and grease is holding its own in competition with the foreign oils, and its future relative position depends largely upon the supply. Nevertheless, with the rapid development and increased public acceptance of detergents with a petroleum base since 1946, this major animal fat also faces a somewhat uncertain future. Trade reports indicate that about 10 percent of the soap market has been captured by such detergents, but a more accurate comparison on the inroads of petroleum must await the publication of this information by the United States Department of Commerce.

4. *Consumption of lard and fat cuts do not respond to price changes as much as many other foods.* The fact that the consumption of lard and fat cuts does not respond to the price changes as rapidly as meat and many other foods, is an important factor that must be listed on the unfavorable side of the equation when viewing the future relative position of lard. This significant fact was pointed

out by Mr. Oscar G. Mayer⁴ who indicated that the failure of the fat group to respond to price reduction is explained by the human physiological demand for fat which, while insistent up to a certain point, is highly inelastic beyond this point. This tendency also has been demonstrated clearly by the relatively stable total consumption per capita of lard and shortening, and butter and margarine, as explained in points 1 and 2, and by the decreased relative demand for fat cuts in the South. Also of importance is the fact that studies show that fat consumption for each income group in the United States is substantially above each group's basic fat requirements.

Looking at the future, this fact is especially significant since the relatively strong demand for meat and probable abundant supplies of feed will encourage hog production which will tend to increase the supply of lard—a joint product. The unfavorable relationship of lard, resulting from a large supply, thus even may be accentuated by a decrease in cotton and soybean acreage. Decreasing acreage of these crops would result from a more prompt response of production to diminishing demand prospects for their products and increased competition from foreign imports of tropical oils. Despite the long transportation from southeast Asia to the United States, coconut oil and palm oils seem to hold a definite advantage in relative cost (aside from the cost arising from trade restrictions) over temperate zone oils which can be used for similar purposes. Extensive wartime plants of the oil palm in the Belgium Congo will come into bearing before 1955, and the somewhat less favorable outlook for natural rubber in the Netherlands East Indies and British Malaya, seems to favor greater vegetable oil production in this area.⁵ The relatively strong demand for protein feed, however, may be an offsetting factor keeping soybean acreage at a high level.

5. *Development of processing techniques for fats and oils has tended to make less important the peculiar characteristics or adaptability of any of the individual fats.* The rapid advances in the understanding of the chemistry of fats and oils is tending to work in the direction of making them more and more substitutes for each other. This definitely places the animal fats at a disadvantage since the basic cost

⁴ "Some Observations on the Economics of the Meat Industry," Mr. Oscar G. Mayer, President, Oscar Mayer & Co., Inc. An address made by Mr. Mayer at the 34th Annual Convention of the Institute of American Meat Packers, October 20-24, 1939.

⁵ Source: *World Trends in Major Oil Crops*, United States Department of Agriculture, March, 1946.

of land and labor resources is greater than in the case of vegetable oils, and since historically their particular characteristics have aided in placing them in an advantageous value position. A current exception is soybean oil where flavor stability is cited as a problem requiring continued research. Continued advancement in processing techniques of this nature will work towards making one fat a complete substitute for another, even more than is now the case. For example, in some areas of the South, cottonseed oil is used as a partial supplement to the butterfat in ice cream. On the other hand, the wide differential in fats and oils prices last spring indicates there is still considerable price independence. This widening of the adaptability of all fats and oils may result in an especial hardship on butter, which had had a definite relative price advantage over a long period of years, but will also affect lard.

Conclusions

The pros and cons outlined above do not lend themselves to thorough statistical measurement. Furthermore, there probably are a large number of additional factors (many unknown at the present time), that will tend to affect the future relative position of the animal fats. Therefore, an exact forecast cannot be made on just how these pros and cons will balance themselves out over the next 10-year period. My conclusion would support the view that the pros will modify past trends but do not fully offset the cons and that the animal fats face a real challenge in the decade ahead.

DISCUSSION

L. J. NORTON

University of Illinois

I agree with Jasspon that the problem of consumption is not one of basic human needs but rather one of purchasing power. I thoroughly agree with his last recommendation, that we should relax our export controls. We are committed to general freedom in markets within this country and should not allow export controls to be used as a subterfuge to influence domestic situations. The surest road to domestic control is rigid export control.

With Eggert's general position that the relative price position of animal fats may be weak, I also concur. An exception should be made for butter, which I will discuss later.

• Mr. Day asked me to comment on the competitive situation in fats and oils. Does competition now prevail? World trade in these commodities is affected by export and import controls, price ceilings and floors, long-term

fixed-price contracts, rationing, etc. For example Our 1948 crop of soybeans is now estimated at 206 million bushels, a very large crop, and total supplies of all oil seeds will produce oil and meal well in excess of our needs. Europe is short on fats and protein feed, and the cheapest way to ship these products from this country is as bulk soybeans. Europe has the equipment to process them since formerly large quantities of Manchurian soybeans were imported. But to export soybeans our government must issue export permits. Competition is not allowed to operate.

Fats and oils may be grouped into several broad classes. No two oils are precisely alike. For some uses a particular oil is sought, for others much substitution is possible. Four broad classes of use are (1) edible and culinary animal fats: butter and lard; (2) edible and culinary vegetable oils: cotton seed, soybean, corn, peanut, and olive; (3) the drying oils for paint and other quick-drying purposes: linseed and tung; (4) the soap fats and oils: tallow, palm, and coconut.

In view of substitution over-all figures have value. Let us consider the world picture. World output for 1947 was estimated at about 15 percent below prewar, but with the growth in population per capita supplies were about one-fourth below prewar. The "ability to do without" was large. World trade was even lower, in 1947 about 50 percent of prewar, but will be higher in 1948 because of larger supplies.

There are four basic gaps to fill: (1) the loss to the Western world of exports of Manchurian soybeans, (2) the decline of India as an exporter, (3) the failure of the Netherlands Indies to export in prewar quantities, and (4) the decline in indigenous production of animal fats.

Considering these in order: (1) the only western country that displays any vigor in developing a soybean industry is the U. S. A., and we use most of our expanded output at home. Under competitive conditions exports from this country would fill part of the gap left by the shutting off of Manchurian supplies. (2) The Indian gap must be filled by increased shipments from elsewhere. (3) In time the Netherlands Indies will likely export above prewar quantities. A basic problem is the destruction of factories needed in production of palm oils. (4) Production of indigenous animal fats will rise in the next 12 months in response to larger supplies of feeds. But it is unlikely that world feed supplies will permit as high per capita production of animal fats as in prewar years for any considerable period in view of increased population and the necessity of more grain for human use.

It seems likely that over the world per capita supplies of fats and oils may continue short in relation to prewar for many years. Prices will depend on economic conditions. A rising living standard would mean increased use of fat, if for nothing more than soap.

I shall comment briefly on a few competitive situations.

Butter and margarine. Economically butter is the superior food. Consumers both in the U. S. A. and in Western Europe will pay premiums for butter. In my grocery store I note butter is priced about twice as high as margarine. In the U. S. A. milk output has not kept pace with population and the increased use of milk and other dairy products so as to maintain per capita butter consumption; in 1948 it will be about 6.5 pounds less

than in 1938-41. One reason why this gap has not been closed by increased margarine use, estimated for 1948 at 3.9 pounds over 1939-41, or about 60 percent of the drop in butter, is the greater consumption of fat in invisible forms. Our increased consumption of milk and cream alone is equivalent to about two pounds of butter. Very likely, output of margarine may increase in the year ahead. Certainly consumers should have the right to buy it in a convenient form.

Outside the U. S. A. most people use whatever fats are available and so competition does not freely operate. More feed will likely increase butter output in Europe during the next year, but supplies of fats are so short that this will not affect total use of other fats. A chain reaction of displacement might finally mean more badly needed soap. The long pull is probably for more margarine and less butter, primarily because of increased use of milk in other forms.

Lard versus vegetable shortening Here it is—hogs versus the cotton, soybeans, and peanut fields and palm trees. In the U. S. A. supplies have not been adequate to let consumers use either lard or vegetable shortenings in prewar quantities. These decreases have been offset at least in part by increases in invisible consumption of fats in meats, eggs, etc. Vegetable oil products will increase in supply in the next 12 months, and lard may decline in the next six months but increase sharply by a year from now.

How about the longer pull? Lard is a minor by-product of a joint-product enterprise—hog raising—and so our volume of lard is determined largely by the output of meat although it may be affected by both feeding and packing-house practices. Hog production will increase in the next twelve months. However, except for the wartime splurge when we converted our surplus CCC corn and wheat and part of Canada's wheat into pork, the hog industry shows no great tendency to expand. It depends on corn. Our acreage of corn is pretty well stabilized, hybrid corn has had its full constructive effect on yields and the adverse effect of its ability as a soil miner has probably not been fully reflected in yields. We can readily exaggerate the possibilities of large expansion in hogs and, therefore, in lard output.

Lard as a by-product must be priced so that whatever quantity is produced can be disposed of. A competitive market mechanism insures this. If we could tap the market which apparently has a preference for lard, Central Europe, we would have no trouble selling all our output. Prospects for doing this are beyond the scope of this paper, but they do not seem too bright. Likewise, the development of income-producing enterprises in the tropics, as for example sugar in Cuba and petroleum in Venezuela, provide increased outlets for lard.

Cotton, historically our largest source of food oil, is probably a contracting industry for a well-known reason. Cottonseed is a by-product of a joint enterprise. Peanuts are essentially a food crop. Corn oil depends on volume of cornstarch and sugar. Coconut oil in the U. S. A. goes largely into soap because of its technical superiority. It is not a by-product but a tree crop with a long production cycle. Soybeans are grown solely for the major products—meal and oil—roughly of equal value. The rapid rise in this crop filled the gaps caused by the decline in cottonseed in the 1930's.

and the wartime decline in imports of copra. The output of soybeans will depend on direct competition with the feed crops which it displaces. Adding a soybean crop in a rotation of corn, oats, and clover means less of these feed crops. The question is: Will the value of the soybean crop exceed the value of the displaced crops? In view of the high value of soybean meal as a supplementary livestock feed and the likelihood of continued demand for oils, assuming freer world trade, a large acreage of soybeans is likely to continue in the areas where the crop is well adapted.

Prices indicate soybean oil to be somewhat inferior as a food oil to cotton-seed oil. Increased output of cottonseed in 1948 will push soybean oil down the scale. We will likely export more and also use more in the competitive drying oil field where soybean oil can be used. Such use expanded greatly in the past year, partly as a result of a pegged linseed oil price. In view of the present very large spread between prices of linseed and soybean oils, further expansion in soybean oil for drying purposes is likely.

What has all this to do with the lard versus vegetable shortenings? The volume of supplies is of basic importance. Whether a commodity is a by-product or a main product, or has a strong or weak growth trend will influence its future volume. In the long run output of vegetable oils will likely increase more or be better maintained than will that of animal fats.

Another factor is consumer preference. Technical developments in producing a bland stable vegetable shortening and intensive merchandising caused shortening to gain in consumer preference over the older types of lards. The best evidence is comparative prices. That the meat industry recognizes this is evidenced by the intensive research recently done on lard and by the facts that the new lards look like shortenings and are packaged, and in some stores, priced like the well-known brands of vegetable shortening. Whether these new lards can overcome the lead of the vegetable shortenings in the battle for consumer favor, I do not know. We will at least have a more competitive situation.

Over the world the vegetable oils will likely gain on the animal fats. Our capacity to produce the grains needed to produce animal fats is lower than our capacity to produce tropical vegetable oils and field crop oil seeds.

One could mention many more competitive situations. Competition is keen among the paint oils. Certain oils have technical characteristics which cause price to be a small factor in certain uses but for rather broad classes of use price competition is keen. Likewise, much competition exists among oils in the soap field. The increasing use of synthetic detergents is an important factor which we do not have time to explore.

In conclusion I wish to express my personal preference—many people would say prejudice. The basic world economic problem is to increase output. The needs of over two billion people make this desirable. The sooner we can re-establish genuine competition in pricing, trade, and production, the quicker we will get maximum world production and better distribution. The fats and oil field is now infested with a great variety of governmental regulations. Easing in the supply situation should provide an opportunity for increased relaxation and final elimination of these regulations.

ROUNDTABLE ON LIVESTOCK MARKETING RESEARCH

Chairman. Geoffrey S. Shepherd, Iowa State College

RESEARCH INTO THE PROBLEMS INVOLVED IN MARKETING SLAUGHTER LIVESTOCK BY CARCASS WEIGHT AND GRADE*¹

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THE marketing of slaughter livestock is the most important marketing activity with which the farmers of the United States are concerned. Cattle are kept on about 80 percent of the farms of the country, hogs on about 60 percent, and sheep and lambs on about 9 percent.² Although cattle are kept on many farms primarily for milk rather than for meat, the veal calves and discarded dairy animals from these farms produce about one-fourth of the combined beef and veal of the country.³ The cash farm income obtained from meat animals accounted for over 26 percent of the total cash farm income from all crops, livestock, dairy and poultry products, and government payments during the years immediately preceding World War II,⁴ and 32 percent in 1947.⁵ Comparable figures for dairy products, which ranked second, were about 17 percent and 13 percent respectively. The efficient marketing of slaughter livestock will become increasingly important in the years ahead when farmers are likely to receive a much smaller proportion of the consumer's meat dollar than is the case during the present boom.

It is generally recognized that the physical operations in a modern meat packing plant leave little to be desired either from the standpoint of efficiency in slaughtering and processing or from the standpoint of utilization of by-products. It is in other areas between producers and consumers that greater efficiency is an urgent need.

* A paper given at the Annual Meeting of the American Farm Economic Association, Green Lake, Wisconsin, September 14, 1948.

¹ Paper No. 2425, Scientific Journal Series of the Minnesota Agricultural Experiment Station, Contribution of the Division of Agricultural Economics

² 1940 Census.

³ U. S. Dept. Agriculture Yearbook, 1922, p. 284.

⁴ Agricultural Statistics 1941, p. 549.

⁵ The Farm Income Situation, January, 1948 p. 3.

There is a general lack of efficiency in the local assembly of live-stock and in the movement of the animals to the place of slaughter. There is considerable duplication in services rendered by agencies handling livestock, and a wasteful use of feed in the "filling" process. There are weaknesses in the pricing mechanism and a tendency to generalize prices paid for slaughter animals instead of paying each individual producer the true value of the actual weight and grade of product delivered. Likewise there is need for improvement in the distribution of meat, and for the development of ways and means whereby consumer preferences can be brought into sharper focus than is the case at present.

For many years substantial emphasis at the state agricultural experiment stations has been placed on the nutritional requirements of slaughter livestock. More recently increasing emphasis is being given to work aimed at improving the genetic make-up of slaughter hogs. Significant results have been achieved from both of these important research activities.

Economic gains from improved breeding and feeding may be due to the resulting greater output per unit of feed, or to an improvement in the quality of the product. The distinction between these two types of improvements is highly significant. Progressive farmers will tend to adopt that practice which reduces production costs. On the other hand, a change in technique which improves the quality of product without affecting physical input-output ratios is likely to make little appeal to producers unless they receive a higher price for the superior product. Under existing market conditions butcher hogs are sold in the United States by live weight with little or no sorting or pricing on the basis of quality,⁶ except for gilts advanced in pregnancy and hogs with obvious defects. In other words, that part of the work of the animal geneticist or nutritionist, which leads to an improvement in the relative proportions or quality of high value pork cuts, will have little practical significance unless and until consumer preference is reflected in a differential price to producers.

Indications are that quality is given more consideration in the pricing of other species of slaughter animals than is the case with hogs. Nevertheless, there is considerable disparity between prices paid for individual animals or lots of animals and actual values. In the case of an individual slaughterer, this disparity probably disap-

⁶ *The National Provisioner*, July 5, 1948, p. 57.

pears with the purchase of large numbers of animals, but the individual farmer is concerned with the actual value of his particular animal or lot

Interest in the desirability and practicability of marketing slaughter livestock by carcass weight and grade has developed during recent years. Some pioneering work was carried on at the Iowa Agricultural Experiment Station during 1938 and 1939.⁷ In this study it was found that experienced packer buyers were not able to appraise accurately the cut-out value of individual lots of hogs. The Minnesota Agricultural Experiment Station began work with slaughter cattle and butcher hogs in 1946, and the Wisconsin and South Dakota Stations with veal calves and slaughter lambs in 1947. "Marketing Slaughter Livestock by Carcass Weight and Grade" was adopted as a regional project by the North Central Livestock Marketing Research Committee in March 1947. The over-all project included four sub-projects covering (1) cattle, (2) veal calves, (3) hogs, and (4) sheep and lambs. Grants from R. M. A. funds were made to the cooperating states in the fall of 1947 and additional funds from this source have been made available for fiscal 1949.

Seven state agricultural experiment stations are now at work on one or more of these sub-projects. These states include Iowa, Kansas, Michigan, Minnesota, Ohio, South Dakota, and Wisconsin. Four other corn-belt states expect to begin work on various sub-projects during the current fiscal year. These include Indiana, Kentucky, Missouri, and North Dakota. The Departments of Agricultural Economics and Animal Husbandry at the various state experiment stations are cooperating on this project at the state level. Three bureaus of the United States Department of Agriculture are cooperating with the state experiment stations. These include the Bureau of Agricultural Economics, the Production and Marketing Administration, and the Bureau of Animal Industry.⁸ Packing plants in the various states of the region are cooperating by making

⁷ Shepherd, Geoffrey, Fred J. Beard, and Arval Erikson, *Could Hogs Be Sold by Carcass Weight and Grade in the United States?* Iowa Agricultural Expt. Sta., Res. Bull. 220, pp. 462-471, January 1940.

⁸ The B. A. E. has employed a Cooperative Agent, with headquarters at University Farm, St. Paul, Minnesota, to assist the state workers with the collection, tabulation, and analysis of data. The P. M. A. has assumed responsibility for grading all carcasses and wholesale cuts. Graders located near the slaughtering plants where work is in progress will be assigned to this work. The B. A. I. will assist with the measuring and will supervise the cutting of hog carcasses in plants where this work is in progress. Each of these U. S. D. A. bureaus has designated a staff member to consult and advise with the regional Technical and Executive Committees.

their facilities and personnel available for the collection of primary data.

The approach to the problem of marketing slaughter livestock, by carcass weight and grade is not the same for all species.⁹ Beef, veal, and sheep and lamb carcasses are sold in the wholesale trade, and prices are quoted on the basis of the established official U. S. Grades. In purchasing these species on the live weight basis, buyers attempt to arrive at actual value by estimating the carcass grade and dressing yield. Consequently, one approach to the problem for these animals is to determine the departure of these estimates from the actual yields and carcass grades and to determine the economic significance of these errors of estimate. On the other hand, hog carcasses are not sold as carcasses, but in the form of wholesale cuts and trimmings. No official government standards have been established for carcasses of this species. Consequently, the first step is to establish objective carcass standards which have economic significance. It will then be possible to measure the relative accuracy of the live buying method and the carcass weight and grade method.

This paper will be confined to slaughter cattle and hogs since the work at Minnesota has been limited to these species. The results of these studies should be considered as being tentative or suggestive rather than conclusive. The work was done at a single slaughtering plant, and data are based upon a relatively small number of animals and carcasses.

Slaughter Cattle Studies¹⁰

Data were obtained on 400 head of slaughter cattle of which 209 were steers, 76 heifers, and 105, cows, at the Geo. A. Hormel & Co plant, Austin, Minnesota. The same packer buyer estimated the dressed yield to the nearest one-half percent, and the carcass grade on the basis of the upper one-third, middle one-third, and lower one-third of each official grade, for each animal separately.¹¹ The car-

⁹ Gerald Engelman, "Carcass Grade and Weight Studies in Marketing Livestock," *This JOURNAL*, November, 1947, pp 1424-8.

¹⁰ Professors E. F. Ferrin and P. A. Anderson, Division of Animal Husbandry, University of Minnesota, cooperated on these studies. Fred J. Beard and Charles E. Murphey, Standardization and Grading Division, Livestock Branch, P. M. A., and Knute Bjorka, Bureau of Agricultural Economics, rendered invaluable assistance.

¹¹ It is recognized that there is some variation in the ability of buyers to estimate the dressing yields and carcass grades of slaughter cattle. The buyer who made these estimates had many years experience and was accustomed to the frequent checking of his estimates against the actual yields and carcass grades of the animals.

casses were graded by one official government grader on the basis of the upper, middle, and lower one-third of each official government grade.¹²

The divergence between estimated and actual yields was greater for individual cows than for individual steers and heifers,¹³ and greater for individual steers and heifers than for lots of steers and heifers. The standard deviation was 2.96 percent for individual cows, 1.65 percent for individual steers and heifers, and 0.83 percent for lots of steers and heifers.¹⁴ This reduction in the standard deviation for lots compared with individual steers and heifers indicates that errors¹⁵ in estimating yields of individual animals in a given lot tend to cancel each other out to a certain extent.

About 74 percent of the estimates for individual cows would be expected to fall more than 10 percent above or below actual yields compared with 54 percent for individual steers and heifers, and 33 percent for lots of steers and heifers. Nearly 50 percent of the estimates for individual cows would be expected to fall more than 20 percent above or below actual yields, compared with 22 percent for individual steers and heifers and only 2 percent for lots.

The divergence between the estimate of carcass grade and actual grade was greater for individual cows than for individual steers and heifers, and greater for individual steers and heifers than for lots of steers and heifers. The standard deviation between the estimated and actual grades was about one-half of a full grade for cows, a little more than one-third of a full grade for steers and heifers, and about one-fourth¹⁶ of a full grade for lots of steers and heifers.¹⁷

Farmers who sell cattle by lots are concerned with a smaller error per hundredweight than farmers who sell animals singly or

¹² No effort was made in this study to determine possible variations in the work of the different carcass graders.

¹³ The difference between the variance for steers alone and that for heifers alone did not approach statistical significance at the 10 percent fiducial limit. Therefore these classes were combined.

¹⁴ The respective probable errors were 2.00, 1.11, and .56.

¹⁵ In this paper, the term "error" is used to indicate divergence between estimated and actual yields, and live and carcass grades.

¹⁶ There is no exact measure of the reduction in the error of estimating carcass grades for lots of slaughter steers and heifers compared with the error for individual animals for the simple reason that an average grade for a mixed lot of animals cannot be precisely determined. However, it is possible to approximate the reduction in the error of estimate. The method used involves ascribing arbitrary weights to the different carcasses according to grade.

¹⁷ The standard deviation was .49 of a full grade for cows, .37 for individual steers and heifers, and .25 for lots of steers and heifers. The respective probable errors were .33, .25, and .17.

in small groups, but the small grade errors for lots probably are much more important in terms of the total value error than the large errors for individuals. Here again, individual errors within lots tend to cancel each other out to some extent. About one-fourth of the estimated grades of individual cows would be expected to be placed in the same one-third of a full grade by the official grader, compared with one-third for individual steers and heifers and one-half for lots of steers and heifers.

A majority of the cattle were purchased on the carcass weight and grade basis, and, hence, a liveweight price was not negotiated on the animals. For that reason, liveweight prices per hundredweight were estimated on the basis of the buyer's estimate of carcass yield and grade, while the actual value was calculated on the basis of the actual yield and the official grade.¹⁸

The carcass prices used in these calculations for steer and heifer carcasses are based upon the unweighted average wholesale price of good grade beef steer carcasses at Chicago during 1947, with price differentials between the various official grades adjusted on the basis of the differentials which prevailed during the 5-year period 1937-41.¹⁹ The price for the middle one-third of each full grade was the average price for the full grade. Prices for the high one-third and low one-third grades were adjusted by one-third of the spread between the full grades. The same method was followed in arriving at the level of cow carcass prices.

The total price error per 100 pounds liveweight and the part of the total error due to error in estimating yield and the part due to error in estimating grade are shown for each of the 20 animals in one sample lot in table 1. The range in total price errors per 100 pounds of liveweight was from -\$1.82 for one animal to +\$2.31 for another. On the basis of a 1000 pound steer, one steer was valued \$18.20 too low and the other \$23.10 too high. In some cases

¹⁸ It is apparent that estimated prices per 100 pounds liveweight, based entirely upon carcass prices or values, are not the exact prices that would have been offered by the buyer because by-product credits and operating costs are ignored. If these items had been included in the calculations, the result would have been to shift both the estimated prices and the actual values per 100 pounds liveweight in the same direction and to about the same extent.

¹⁹ It was believed that price differentials between the different grades of beef carcasses were more representative of long time price relationships from 1937-41 than during and immediately following the period of price controls when this study was under way.

a price error in one direction due to the error in estimating yield was compensated in part by a price error in the opposite direction due to an error in estimating grade, but more often the two errors tended to be in the same direction.²⁰ The tendency for the total price error between individual steers to cancel out to a certain extent

TABLE 1 DIFFERENCE BETWEEN ESTIMATED PRICE AND ACTUAL VALUE PER 100 POUNDS LIVWEIGHT OF INDIVIDUAL ANIMALS IN A SAMPLE LOT OF SLAUGHTER STEERS*

Steer Number	Estimated Price per 100 lbs Liveweight	Actual Value per 100 Lbs live-weight	Price Error per 100 Pounds Liveweight		
			Total Price Error	Part of Total Due to Error in Estimating	
				Yield	Grade
1	\$23 83	\$22 54	\$+1 29	\$+1 29	\$ 00
2	24 03	22 15	+1 88	+1 03	+ 85
3	22 36	22 51	- 15	+ 67	- 82
4	23 85	23 44	+ 41	+ 41	00
5	22 36	24 18	-1 82	- 20	-1 62
6	22 56	22 38	+ 18	+ 18	00
7	23 62	23 90	- 28	- 28	00
8	23 82	22 43	+1 39	+ 54	+ 85
9	24 06	23 93	+ 13	+ 13	00
10	24 06	24 39	- 33	- 33	00
11	22 15	22 74	- 59	+ 95	-1 54
12	23 82	21 51	+2 31	+ 62	+1 69
13	23 62	23 62	.00	00	00
14	23 41	22 82	+ 59	- 28	+ 87
15	23 62	22 59	+1 03	+1 03	00
16	22 36	23 88	-1 52	- 61	- 88
17	24 05	22 92	+1 13	+ 26	+ 87
18	24 26	24 16	+ 10	+ 10	00
19	23 82	22 38	+1 44	+ 59	+ 85
20	24 05	23 77	+ 28	- 62	+ 90
Lot Average	23 49	23 10	+ 39	+ 26	+ 13

* This lot appears as lot 5 in table 2.

is indicated by an average price error for the lot of +\$.39 per 100 pounds liveweight.

As would be expected from the physical data, the divergence between estimated price and actual value was less for steers and

²⁰ About 49 percent of the total price error for individual steers and heifers was due to errors in estimating grade, 27 percent to errors in estimating yield, and 24 percent to the interaction of the two factors. The basic equation for this determination was $\sigma_T^2 = \sigma_y^2 + \sigma_g^2 + 2\gamma_{yg}\sigma_y\sigma_g$ where, σ_T^2 =total variance, σ_y^2 =variance due to yield error, and σ_g^2 =variance due to grade error.

heifers by lots than for individual animals. The standard deviation of total price error per 100 pounds liveweight was 1.33 for individual steers and heifers, and .79 for steers and heifers by lots. Here also, there was a tendency for price errors between lots to cancel each other out to some extent (table 2). The range in total price errors per 100 pounds liveweight for the different lots was from —\$.95 to

TABLE 2. DIFFERENCE BETWEEN ESTIMATED PRICE AND ACTUAL VALUE PER 100 POUNDS LIVWEIGHT OF SLAUGHTER STEERS AND HEIFERS BY LOTS*

Lot Number	Number of Head	Estimated Price per 100 lbs Liveweight	Actual Value per 100 Lbs Liveweight	Price Error per 100 Pounds Liveweight			
				Total Price Error	Part of Total Due to Error in Estimating		
					Yield	Grade	
1	15	\$23.13	\$22.23	\$.90	\$.15	\$.75	
2	10	25.55	25.16	+.39	— .38	+.77	
3	15	26.68	26.40	+.28	+.15	+.13	
4	15	24.93	24.72	+.21	+.34	— .13	
5	20	23.49	23.10	+.39	+.26	+.13	
6	19	25.73	24.44	+1.29	+.46	+.83	
7	16	28.53	27.94	+.64	— .08	+.72	
8	15	27.78	27.04	+.74	— .08	+.82	
9	6	22.51	23.28	— .77	— .13	— .64	
10	17	23.88	23.95	— .08	— .21	+.13	
11	11	22.46	22.13	+.33	+.31	+.02	
12	10	23.39	23.52	— .13	— .23	+.10	
13	14	21.84	21.87	— .03	+.15	— .18	
14	13	28.76	27.22	+1.54	+.15	+1.39	
15	13	28.68	27.54	+1.14	+.57	+.57	
16	11	26.19	25.03	+1.16	+.54	+.62	
17	13	24.85	25.80	— .95	— .80	— .15	
18	18	21.59	22.46	— .87	— .61	— .26	

*The lots are arranged in the order in which they were purchased and slaughtered.

+ \$1.54. On the basis of 20–1000 pound animals per lot, this would represent an underestimate of \$190 for one lot, and an overestimate of \$308 for the other.

The probability of agreement between estimated price and actual value per 100 pounds liveweight for individual cows, individual steers and heifers, and lots of steers and heifers is shown in table 3. The actual value of about 40 percent of the cows would be \$1.00 per 100 pounds liveweight or more above or below the estimated price, compared with about 45 percent of the individual steers and heifers,

and 20 percent of the lots of steers and heifers.²¹ Similarly, the actual value of about 9 percent of the cows would be \$2 00 per 100 pounds liveweight or more above or below the estimated price, compared with about 13 percent of the individual steers and heifers and about 1 percent of the lots of steers and heifers.

The reduction in estimates of physical yield and grade errors,

TABLE 3 PROBABILITY OF AGREEMENT BETWEEN ESTIMATED PRICE
AND ACTUAL VALUE PER 100 POUNDS LIVWEIGHT OF
SLAUGHTER CATTLE, 1947 PRICES*

Price Error per 100 Lbs. Liveweight (actual±estimated)	Individual Animals		Lots
	105 cows	251 steers and heifers	18 lots of steers and heifers
	(percent)	(percent)	(percent)
\$ 25	16 8	14 9	24 9
50	32 9	29 3	47 4
.75	47 6	42 7	65 8
1 00	60 5	54 8	79 5
1 25	71 2	65 2	88 7
1 50	79 8	74 2	94 3
1 75	86 3	81 1	97 3
2 00	91 1	86 8	98 9
2 25	94 4	90 9	99 6
2 50	96 6	94 0	—
2 75	98 1	96 1	—
3 00	98 9	97 6	—
3 25	99 5	98 5	—
3 50	—	99 1	—

* For explanation see text.

and, hence, in price errors for lots compared with individual animals is highly significant. It suggests that for all slaughterers combined, or even for a given large slaughterer, about the same amount of money probably is paid for all cattle purchased under the present liveweight method as would be paid under the carcass weight and grade method. However, the money would be distributed differently among the different sellers. Under the carcass method, the returns would be distributed more nearly in accordance with the actual value of the product delivered. Furthermore, many animals are not sold in lots but as individual cows, bulls, or steers and heifers or in small groups of 2 or 3 head at a time.²²

²¹ The standard deviation of price errors was 1.18 for cows compared with 1.33 for individual steers and heifers

²² Corn Belt Livestock Marketing Research Committee, *Marketing Livestock in the Corn Belt Region* Bulletin 865, South Dakota Agricultural Experiment Station, November 1942, tables 44 and 45.

Slaughter Hog Studies

The basic data for the hog carcass phase of the study also were obtained at the Geo. A. Hormel & Co. plant at Austin, Minnesota. A total of 695 carcasses were selected, varying in weight from 115 pounds to 215 pounds, which would approximate the liveweight range of from 180 to 300 pounds. The entire 100 pound range was divided into 10 consecutive weight groups and an effort was made to obtain, within each 10-pound weight group, carcasses ranging in finish from very fat to very lean.

Detailed carcass measurements were taken in the coolers. The carcasses were cut by personnel selected from the regular cutting crew in the plant according to standardized cutting procedures.²³ The various cuts and trimmings were weighed to determine the contribution of each to the total weight of the carcass. The analysis is concerned with the possibility of developing objective grade standards for hog carcasses on the basis of one or more of these measurements.

Examination of scatter diagrams showing the relationship of the different carcass measurements to various combinations of high value cuts indicated pronounced and consistent superiority of average backfat thickness to the other measurements. Length of body appeared to rank second, but considerably below backfat, and the other measurements were below body length, with belly pocket thickness at the bottom of the list.

The average correlation of backfat to the percent of four lean cuts (hams, loins, butts and picnics) plus lean trimmings and belly which we have termed the index of lean,²⁴ for the entire sample was $-.8589$, and the corresponding coefficient of determination was $.7377$. Since backfat thickness explains 74 percent of the variability in the index of lean, it seemed doubtful whether much improvement in correlation could be expected from the addition of other variables. However, since the scatter diagrams indicated that length was the second most promising measure, multiple correlation analyses, using backfat and body length as the two independent varia-

²³ The cutting operations followed in this plant were observed by representatives of the Standardization and Grading Division, Livestock Branch, PMA, and a standardized cutting procedure prepared.

²⁴ As used in this paper, the index of lean, consequently, refers to the percentage of the entire carcass which is made up of the four lean cut (hams, loins, butts, and picnics) plus lean trimmings and belly.

bles, were calculated separately within each of the 10 weight groups. There was relatively little improvement in the R_{123} over the r_{12} for backfat alone. The relatively small improvement is explained largely by the high degree of intercorrelation between average backfat thickness and body length. This means that, for the same weight of carcass, if backfat is decreased, length will tend to be increased, and the index of lean will be increased correspondingly.

The index of lean is a quantitative, objective measure of degree of finish. Instead of being described as very fat, moderately fat, lean, etc., carcasses may be classified by measurable indices of lean, such as 66.0, 68.0, 70.0, etc. An index of 70 means that the four lean cuts plus lean trimmings and bellies constitute 70 percent of the weight of the carcass. The problem is to provide means for evaluating hog carcasses according to their expected indices of lean before they have been disassembled on the cutting floor.

The first step was to compare carcasses having the same index of lean, but differing in carcass weight. This was done to develop the expected relationship of backfat thickness to carcass weight at a given index of lean. Within each 10-pound weight group the expected backfat thickness, when the index of lean was equal to 70.0, was computed. This revealed a slight curvilinear tendency; for a given index of lean, backfat thickness increases with an increase in carcass weight but at a decreasing rate. The logarithmic equation $\log Y = a + b \log X$ ²⁵ was used to describe this change in backfat thickness associated with changes in carcass weight when the index of lean is held constant²⁶.

The next step was to develop the expected rate of change or regression relationship of backfat thickness to the index of lean at any given carcass weight. However, this relationship itself changes with carcass weight. A change in the computed backfat thickness of standardized carcasses, expected with changes in carcass weight (as indicated in the preceding paragraph) is associated with a proportionate and opposite change in the regression coefficient of back-

²⁵ As calculated, the expression reads

$\log Y = 1.0415302 - 0.263,574,408 \log X$,

where Y = expected backfat thickness when the index of lean is equal to 70.0 and X = carcass weight.

²⁶ The potential curve $Y = a + bX + cX^2$ and the semi-logarithmic exponential equation $\log Y = a + bX$ were quite satisfactory for the weight of carcasses used in this study, that is from 115 to 215 pounds, but not for projection beyond these extremes.

TABLE 4. SUGGESTED HOG CARCASS GRADE STANDARD BASED ON BACKFAT THICKNESS AND CARCASS WEIGHT

Carcass Weights	Equiv. Live Wt (approx)	Carcass Grades							
		8		9		10		11	
		Backfat Thick- ness at Margin	Average Index of Lean	Backfat Thick- ness at Margin	Average Index of Lean	Backfat Thick- ness at Margin	Average Index of Lean	Backfat Thick- ness at Margin	Average Index of Lean
(lbs.)	(lbs.)	(in.)	(per- cent)	(in.)	(per- cent)	(in.)	(per- cent)	(in.)	(per- cent)
110-140	165-205	2.3	64.1	2.0	67.0	1.7	70.0	1.4	72.9
140-180	205-260	2.5	64.1	2.1	67.3	1.8	70.0	1.5	72.7
180-220	260-310	2.6	64.4	2.2	67.4	1.9	70.0	1.6	72.6
220-270	310-375	2.7	64.2	2.4	67.1	2.0	70.0	1.7	72.8
								1.3	75.7
								1.1	75.8
								1.2	75.5
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								1.3	75.7
								1.1	75.8

fat to the index of lean. The curve which expresses this inversely proportionate relationship is the rectangular hyperbola and the equation which describes this curve is $y = 1/x \cdot c$ ²⁷

Through the use of these equations it was possible to develop a table showing the expected indices of lean for all weights of carcasses, and for all variations of backfat thickness within the various carcass weight groups.²⁸ It is obvious that such a schedule could not be used to classify or grade hog carcasses in a packing plant due to the minute gradations in backfat thickness between carcasses within a given weight group, and between carcasses in different weight groups. The problem at this point is to combine carcass weights and backfat thicknesses in such a way as to provide a hog carcass standard that is practical and at the same time one that has economic significance. An attempt was made to keep the average index of lean comparable within each grade regardless of weight, and to have the mid-point of one grade separated from the mid-point of the next grade in each of the weight groups by a difference of 3 0 for the index of lean and 0 3 inch for backfat thickness in so far as this was possible (table 4). It is believed that carcasses can be grade on the basis of a difference of 0.3 inch average backfat per grade under usual packing house conditions.

Carcasses in grade 8 would be very fat, and those in grade 12 would be very lean. Carcasses increase in value per 100 pounds with increase in the index of lean up to the point where certain cuts are discounted for lacking quality, or up to the point where the cuts are discounted due to excess weight. Under long-time price relationships, carcasses in grade 10 probably command the highest price.

After developing analytical procedures to predict the combined percentage of hams, loins, picnics, butts, bellies, and lean trimmings in a given carcass on the basis of backfat thickness and carcass weight, the next step was to determine the individual percentages of each separate cut and trim. Each of the components of the hog carcass varies with the index of lean. These relationships were determined by computing the regression of each separate component to the index of lean.

²⁷ Where y = expected regression coefficient,
 x = computed backfat thickness,¹
and c = a constant

²⁸ This table would define a curvilinear surface comparable to the regression surface of a three variable multiple correlation problem.

The location and slope of the regression line for each of the 14 wholesale cuts, trimmings, and skeletal parts to the index of lean were determined as indicated in figure 1. With these two values the average percentage of a given cut or part at any particular index of lean can readily be determined.

With both the index of lean and schedule of prices for each of the component cuts and parts known, the value of the average carcass can be readily determined. The several percentage components of the carcass are simply multiplied by their respective prices, and the sum of these value products will give the carcass value per 100 pounds regardless of carcass weight. The value of a given carcass is obtained by multiplying this sum by the weight of the carcass.

An additional problem in pricing arises, due to the variability in the weight of certain cuts within a given weight and grade of carcass. Hams, loins, picnics, and bellies are priced in the wholesale trade according to weight. There is a variability of the weight of a given cut around its regression line (figure 1) to the index of lean, and, within a given grade there is a variability of the index of lean around the average index for the grade. These two variabilities were taken into account to get at the dispersion of weights of a given cut within any given grade and weight group,²⁹ and thereby to determine the proper pricing of these several cuts in building up the composite value of the entire carcass.

Values of certain weights and grades of carcasses are shown in table 5. The prices used in computing these values are based upon the average price relationship for the several component cuts and trimmings to each other during 1937-41, and the average live-weight price per hundredweight paid by packers (\$24.60) for all slaughter hogs bought in 1947.

Several important tendencies are apparent in the data shown in this table. Within any given weight range, grade 8 carcasses have a lower value than grade 10 carcasses because they yield less of the high value cuts. Another important tendency is the apparent changing relationship of degree of finish with carcass value at different carcass weights. This is because within each weight group the

²⁹ The variance of the index of lean within grades, deflated by the regression coefficient of the particular cut to the index, was added to the variance of this cut around its regression line to obtain the variance of the weight of the cut within a given weight and grade of carcass.

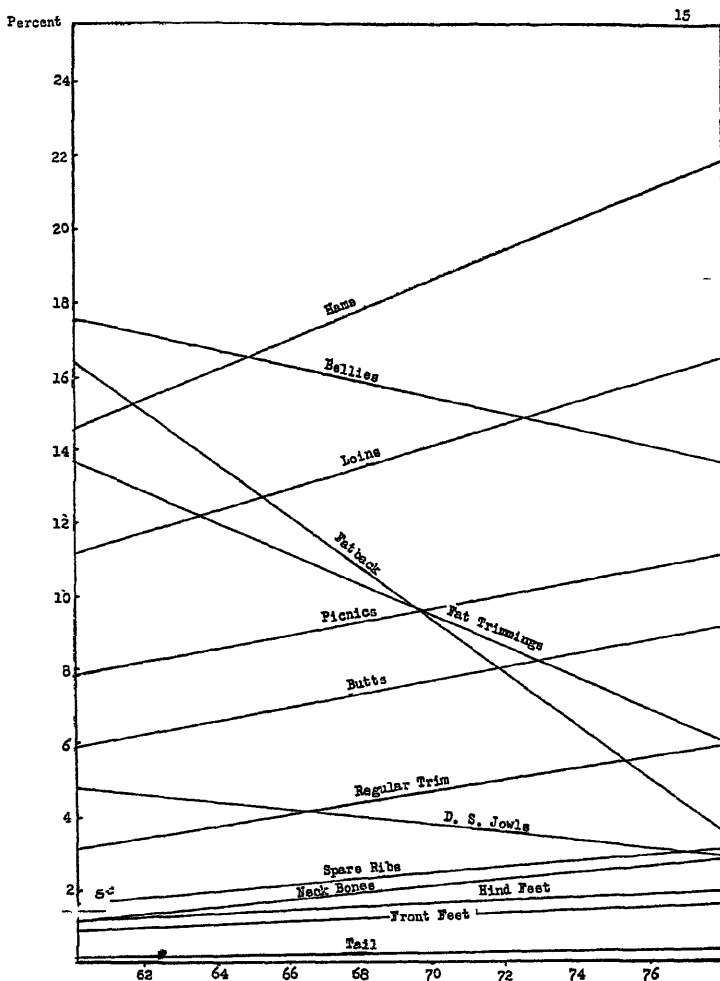


FIG. 1 PERCENTAGE RELATIONSHIP OF THE VARIOUS WHOLESALE CUTS AND TRIMMINGS TO THE INDEX OF LEAN.

weights of hams, loins, and picnics decline with the decline in index of lean, and when the reduced weight of a particular cut places it in a higher price bracket, which is more common with the heavy than with the light weight carcasses, this offsets part of the decrease in

value of the carcass which is due to the higher proportion of lard. Still another important tendency is the decline in value associated with increasing carcass weight within the same grades. Furthermore, the decline appears to take place at an increasing rate, although the rate of decline is probably at a maximum in the 180-220 pound groups.

The particular weight groups shown in table 4 are a grading device, a part of the grading technique, and were established to obtain the optimum classification of carcasses according to physical homogeneity. The economic homogeneity within the grade and weight groups shown in table 4 would be improved by a more refined weight classification such as that suggested in table 5. These refinements could be made within the weight groups required by the grade standard.

One of the primary reasons for conducting these investigations was to compare the relative accuracy of the liveweight and the carcass weight and grade marketing methods in pricing butcher hogs. The suggested carcass grade standards were developed to aid in this analysis. Information for this analysis was obtained on 40 lots of hogs, 5 to a lot, or a total of 200 individual animals, during the first two weeks of October 1947. The live hogs were priced on the basis of average prices for the respective weights for this two week period. Carcasses were graded according to the previously developed standard. Carcass values for the different grades were computed on the basis of prices of wholesale cuts and trimmings. The average carcass value was adjusted to equate with the average live price paid, \$28.39 per hundredweight, both for the 40 lots and the 200 individual animals.

The analytical procedures used to measure relative pricing accuracy depended primarily upon a comparison of variances at the several stages of the marketing process under the different methods. The three value variances pertinent to this analysis are (1) the variance of individual animal values about their mean, (2) the variance of values about liveweight prices paid for lots, and (3) the variance of values about prices which would have been paid under the carcass weight and grade method. The difference between the first and second comprises the reduction in variance accomplished by the present liveweight method. The difference between the first and third comprises the reduction in variance attributed to a possible carcass weight and grade method. These reductions in

variance attributed to the live and carcass methods respectively are measures of the relative accuracy of pricing of the two methods. The third or final variance is the residual variance due to the variations in value within carcass grades. It is a measure of the errors in pricing which would remain after carcass buying.

TABLE 5 COMPOSITE CARCASS VALUES FOR SPECIFIED CARCASS GRADES*

Carcass Weight	Equivalent Liveweight (approximate)	Carcass Grades				
		8	9	10	11†	12†
(pounds)	(pounds)					
110-140	165-205					
110-120		\$39 80	\$40.69	\$41 40	—	—
120-130		39 85	40 65	41 44	—	—
130-140		39 82	40 55	41 24	—	—
Average		39 82	40.63	41 39	—	—
140-180	205-260					
140-150		39 37	40 19	40 83	—	—
150-160		39 26	40 00	40 60	—	—
Average		39 31	40.09	40 71	—	—
160-170		39 18	39 72	40 23	—	—
170-180		38 90	39 44	39 82	—	—
Average		39 04	39 58	40 02	—	—
180-220	260-310					
180-190		38 53	38 90	39 29	—	—
190-200		38 28	38 63	38 91	—	—
Average		38 41	38 76	39.10	—	—
200-210		38 03	38 29	38 49	—	—
210-220		37 79	37.97	38 10	—	—
Average		37 91	38 13	38 29	—	—

* These prices are based upon the average price relationship for the several component cuts and trimmings to each other during 1937-41, and the average live-weight price paid by packers (\$24 60) for all slaughter hogs bought in 1947

† Prices were not calculated for these grades because insufficient data were available to determine accurately the expected frequency of discounted cuts

These variances were computed and the total variance was distributed according to its constituent elements as shown in the table at the top of the next page.

The percentage figures indicate that live buying removes 45 percent of the value variance while carcass buying would remove 82.9 percent (45.0+37.9). These two reductions constitute a

	Variance of Values	Percentage of Total Variance
Total variance of individual animal values	6319*	100 0%
Reduction attributed to live buying	2842	45 0%
Further reduction from live buying to carcass buying	2395	37.9%
Residual variance remaining after carcass buy- ing (within grades)	1082	17.1%

* It should perhaps be emphasized that this estimate of total variance is not an estimate representative for the entire population. This particular section of the analysis was confined to spring farrowed butcher hogs, all within a fairly narrow weight range, arriving at one packing plant from a local trade area, and marketed during one two-week period. Because sampling was random, it was an adequate sample for hogs satisfying the above conditions. The purpose of this analysis, however, was not to determine the total variance of hog values but rather to compare pricing accuracy of different marketing methods, and it is believed to be satisfactory for the latter.

comparison of the accuracy of the two methods. Viewed from another direction, under the live buying method 55 percent of the total variance remains after purchase in the form of a distribution of actual values about live prices paid, while under the carcass method only 17.1 percent of the total value variance would remain after purchase in a similar distribution of values about carcass prices paid.

Because hogs are purchased on the liveweight basis today, any reduction in variance up to this point is of academic importance only. If the variance of values about live prices paid is used as the base, then 68.9 percent of this remaining value variability would be removed through the marketing of hogs on the carcass weight and grade basis.

Conclusions

On the basis of these preliminary studies, it appears that considerable improvement in the accuracy of grading and pricing slaughter cattle and hogs might be brought about through the adoption of the carcass weight and grade method of marketing. Pricing errors due to errors in estimating yield would be eliminated, while those due to errors in estimating carcass grade would be reduced. This would permit more accurate reflection of consumer preferences back to livestock producers and hence tend to bring about more effective allocation of productive resources on the farm. Other apparent advantages would include greater efficiency in the move-

ment of livestock to the place of slaughter, and elimination of unnecessary "fill".

It is important that the practicability of the carcass weight and grade method of marketing, under conditions which prevail in the United States, be thoroughly explored. These include, among others, the identification, weighing, and grading of the carcasses, handling condemnations, making settlement to owners of the animals, and the relative cost of marketing under the carcass weight and grade and the liveweight methods.

It seems probable that this will prove to be one of the most fruitful fields to be explored by those who are interested in bringing about the more effective marketing of slaughter livestock and meats.

DISCUSSION*

GEORGE M. LEWIS

American Meat Institute

As Dr. Dowell points out, a number of the agricultural college people in several of the states have become interested in this subject and are planning also to initiate some research work in this field. An Institute committee, consisting of representatives of a number of meat packing companies, has had the pleasure on a number of occasions in recent years of meeting with members of the North Central Livestock Marketing Research Committee and of discussing this problem with them. We have emphasized with these gentlemen that, in our opinion, there are two basic steps to take in the approach to this type of research. First of all, sound, practical, and objective grade standards must be developed which will represent the value of each type of animal carcass, and second, if and when such a set of satisfactory standards has been developed, it will then be appropriate to make a comparison of this method of value determination with the existing system of marketing livestock to find out which is better, all things considered.

I wish to offer the following comments on some of Dr. Dowell's preliminary and tentative findings.

Comments on the Cattle Study

Estimating yields: In the attempt to estimate the dressing yield of the cattle included in the study, it would seem that the procedure was somewhat contrary to the usual industry practice. One individual did all of the estimating of the yields. These animals included a mixture of steers, heifers and cows. The usual practice in the industry generally is for a buyer to concentrate on one class of cattle. Generally speaking, most cattle buyers have been trained to make their appraisals of yields of cattle on the basis of an entire lot of animals rather than on the basis of individual

* A discussion presented at the Annual Meeting of the American Farm Economic Association, Green Lake, Wisconsin, September 14, 1948.

animals Only a very small portion of the cattle is offered for sale on an individual head basis. A typical buyer's performance, therefore, naturally would be expected to be better on a lot of cattle than on individual animals, not only because of the difficulty involved but also because of the training and experience There is a continual effort to make comparison through training and experience.

Estimating grades In attempting to estimate the grades of beef, there are some significant points to consider. One government grader graded all of the carcasses. This provided no check on possible errors of judgment, and there frequently is just as much difference of opinion, among the experts, in the grading of beef carcasses as there is in the grading of livestock. Furthermore, the inadequacy of the present government grading system, for the purpose of value determination, was recognized, since the carcasses were classified on the basis of upper, middle and lower one-thirds of each official government grade It apparently was assumed that government grades—or at least when divided into thirds—reflect carcass values. In our opinion, this assumption is not valid. We do not believe present government grades and grading adequately represent market values of beef These grades were not developed for this purpose. Experience under OPA demonstrated very forcefully the shortcomings of government grades, both from the standpoint of consistent determination and their proper reflection of beef values.

It is important to keep in mind that there are many factors that determine beef values, such as the nature and location of the market outlets, weights of the carcasses and cuts, kind of feed which the animals have been fed, etc. For example, the United States Department of Agriculture yesterday quoted U. S. Commercial grade steer and heifer beef at Chicago from \$14.00 to \$52.00 per cwt. dressed. The reason for this extremely wide price range is that there existed a variable demand for the wide variety of beef classified under this particular grade of beef.

Therefore, it would seem that the basic problems in this type of research study on cattle are:

First, find out whether different graders consistently can grade beef according to the existing official government grades not only for the full grade, but more particularly for thirds of grades, or for some other division of each of the government grades If this can't be done accurately and consistently, then endeavor to develop adequate objective standards which will assure that an adequate grading job can be done; and

Second, try to determine objectively whether present government grades or divisions thereof, do or do not (as I have contended) reflect accurately the value of beef. If they do not, then grades must be developed which will, and in this connection we believe that it will be found that Government market quotations, based on one or two markets will not measure accurately realization possibilities for the entire country.

Comments on the Hog Study

It is my impression that Dr. Dowell and his associates have made a good start in the development of objective grade standards for hog carcasses He has found that the thickness of fat back bears a fairly high correlation

to the percent of lean cuts. However, this correlation is not nearly perfect, and fat back thickness for different weight hogs may fall short of being a sufficient basis for evaluating completely and accurately individual hog carcasses. For this and other reasons, I believe the study should show how much variation there is in the percentage of the various cuts within a grade. There seems to be no measure of quality for the different hogs within a given weight range and between individual cuts. The proposed grades would classify hog carcasses only on the basis of finish and weight. Provision should be made for proper discount for the sub-standard products. We believe also that these grades would tend to encourage the production of rangy, inefficient type hogs which would have a high index of lean, but which might not be of the desired conformation, type, and quality. In other words, the thickness of back fat and index of lean does not necessarily measure quality.

Therefore, it would not measure value or result in an inducement to raise the right kind of hogs. We suggest a standard for hog carcasses cannot be measured alone on the basis of the percentage of these lean cuts, etc. Length and other carcass characteristics need to be considered further to measure type and conformation, and objective standards are needed to measure yield and quality of the primal cuts.

In our opinion, any set of objective standards developed should not lose sight of the three fundamental characteristics of a good type hog, which include conformation, type, and quality, as well as finish and weight. Certainly no program should be recommended that would tend to discourage the production of properly finished and good quality hogs. Quality embraces firmness, shape of cuts, marbling and tenderness.

It must be kept in mind that in the development of standards and measurements there is a broad demand in this country for pork products of all weights of hogs from the very light to the very heavy types. Moreover, it should be remembered too that the farmer is interested in the total dollars received for his hogs rather than merely the calculated value of only certain lean cuts. At times, hogs not having such a high lean content may yield the owner more dollars because of a higher total yield.

For example, table 5 in Dr. Dowell's paper shows considerable difference in the value of carcasses of different grades within a weight range. Actually, on a live basis, a considerable proportion of this difference might be offset by the higher carcass yield of the better finished hogs.

More Practical Problems Involved: Aside from the possible eventual development of adequate objective standards for animal carcasses, there are a number of very complicated problems and difficulties in connection with the proposed type of marketing livestock by carcass weight and grade. Since we should keep these in mind in looking down the road, and before reaching conclusions, I shall mention some of them.

(1) Maintaining identification of animals would be very difficult. No method of marking, including tattooing, has been perfected that will prevent the mixing of animals before final value determinations are made. This would be particularly serious in the case of animals having large bruises or otherwise subject to discount for quality.

(2) Determination of shrinkage allowances for the time involved when

livestock is in transit and is being held for slaughter. Considerable shrinkage goes on from the time the animals are loaded at the farms until they are slaughtered, and the amount of shrinkage will vary also, depending on the distance traveled, the length of time en route, the method of transportation used, temperature, kind of feed fed and the treatment the animals received en route. This problem of shrinkage allowances would be a difficult one, especially on shipments of live hogs from the Midwest to the East and West Coasts.

(3) The handling of condemnations would be particularly troublesome. Under the present system, condemnation losses generally are spread among all purchases. Under the proposed system, condemned animals, presumably, would be identified.

(4) The time lag in payment to the owners on the animals would create many problems, unless there were to be great changes in where and how livestock is sold and slaughtered. Most livestock producers prefer to receive proceeds from the sale of their livestock at the time of delivery of the livestock to the buyer. This is a particularly troublesome problem where livestock is slaughtered at a considerable distance from point of production.

(5) Most livestock producers, as well as buyers, would be reluctant to place completely in the hands of a government grader the value determination of animals.

(6) There would be considerable additional expense involved which would increase the margin between the price received by producers for livestock and the cost of meat to the consumer.

Meat Industry's Position. I hope that raising these questions will not leave the impression that the meat packing industry is opposed to changes or new developments relating to livestock and meat problems. On the contrary, the industry, I am sure, will welcome such changes or developments as are sound and practicable, and are improvements over the existing methods or practices being followed. As a matter of fact, the industry right along had adopted many new developments and improvements, and as a result, its efficiency of operations, as Dr. Dowell generously points out, are well-known to all. These improvements have occurred in the producing, marketing, processing, distributing, and merchandising phases of the livestock and meat industry.

DISCUSSION*

DAVID G. PATERSON

South Dakota State College

Only limited comments on the paper presented by Dowell and Engelman will be made. In addition, a brief discussion of a similar study being made at the South Dakota station with slaughter lambs will be presented.

Dowell and Engelman are to be commended for so clearly differentiating between the two types of economic gains resulting from improved livestock

* A discussion at the Annual Meeting of the American Farm Economic Association, Green Lake, Wisconsin, September 14, 1948.

breeding and feeding practices. Those improvements which result in greater output per unit of input (feed and other production factors) reduce costs, and so are quite readily adopted by progressive producers. On the other hand, changes in techniques which improve the quality of product without affecting physical input-output ratios have little sales appeal if that increase in quality is not reflected back in higher returns to the producer. Hogs were used to illustrate this point but it applies almost equally well to cattle, calves, and lambs.

The method used to obtain live buying prices in the Minnesota cattle study gives the best possible picture of the buyer's ability to reflect back to sellers the true value differences of individual shipments. The competitive market level is also an important consideration for many buyers. The price arrived at on the basis of yield and grade estimates and carcass prices, plus standard by-products credits less standard operating costs, might be \$32.00 per cwt. for a particular lot of steers. However the actual purchase price might be above or below this figure depending upon the need for cattle and the buyer's ability to "get the job done." In further studies it would be desirable to obtain the prices actually paid for the animals under as nearly normal operating conditions as possible.

In the South Dakota study with lambs the approach to the problem was very similar to that used in the cattle study at Minnesota. We accepted prevailing federal carcass standards (temporarily at least) and proceeded to determine the departure of estimated from actual yields and grades and to measure the economic significance of these errors.

Data on 32 lots comprising 487 lambs have been collected. As the study is yet to be completed, the following results are preliminary and tentative.

Analysis of the grading results reveals a definite tendency for the buyer to underestimate grades of choice lambs and to overestimate the grades of commercial, utility and cull lambs. Part of this bias is inherent in the data because there is not equal probability of over and under estimating grades of top and bottom lambs. For top choice lambs there is only one higher grade; similarly for cull lambs. The buyer can only overestimate the grade because there is no lower grade. However, the buyer tended toward an "average" or "middle" grade to a greater degree than can be explained by the bias alone.

The buyer did a better job of estimating grades for top lambs than for low grading lambs. The percentages of lambs in each grade (on the basis of the federal grading) for which the buyer's estimate was within one-third grade were: Choice—78%, Good—50%, Commercial—38%, Utility—24% and Cull—48%. During the period of this study the errors in grade estimates for lower grading lambs were of greater economic importance than errors in grade estimates for top lambs. For example, the carcass price differential between good and choice lambs averaged about \$1.00 per cwt. while the carcass price differential between good and commercial lambs averaged about \$2.50 per cwt.

The buyer's estimate of the average yield for each test lot was obtained. The buyer's estimates of dressing yield for individual lambs were obtained for only three lots comprising 45 lambs because it was decided that this

was an impractical approach for this species. The lots used in this study comprised 10 to 20 lambs. Seldom are lambs marketed in smaller lots than used in the study.

On the 45 lambs for which individual yield estimates were obtained, the buyer did a relatively poor job, as on 35% of the lambs he was off in his yield estimates by more than 3%. For a number of lots there was considerable difference between estimated and actual average yield. The differences ranged from an overestimate of 3.6% to an underestimate of 4.0%. The standard deviation of lot yield differences was 2.1% and the mean deviation was 1.6%.

The differences between estimated and actual yields were greater for those lots having rather extreme yields. For example, the mean deviation of yield differences for 14 lots with actual yields below 46% or above 50% was 1.9%, whereas for 15 lots with actual yields between 46% and 50% the mean deviation was 1.4%. In making yield estimates there was a definite tendency for the buyer to keep nearer the average or normal yield for a large number of lambs than actual results would justify.

When the buyer overestimated grade, there was a tendency for him to also overestimate yield, and vice versa. The correlation coefficient between grade and yield error (r) was +.49 which is just significant at the 1% level. Grade and yield errors were compounded.

The error between actual value and prices paid to individual shippers is greater than the physical errors in grade and yield estimates alone indicate. This is due to the discrepancies between prices actually paid under regular buying procedures and prices that yield and grade estimates for the lot would indicate. A "theoretical" purchase price was calculated for each of the three lots for which individual yield estimates were obtained. The "theoretical" prices were found by multiplying the carcass price for the estimated grade by the estimated yield. For one lot the actual purchase price was \$1.10 per cwt. over the "theoretical," for another 59¢ over, and for another 3¢ under. The pertinent point here is not that the actual and "theoretical" prices differ, but that the differential between actual and "theoretical" is not the same for each lot.

The ability of different graders to apply uniformly the present subjective carcass grade standards was studied. Each carcass was graded independently by the federal grader regularly assigned to the plant, by the packer grader, and by the station meats specialist. Both the packer grader and the station grader were within one-third grade plus or minus the federal grade 83% of the time. This indicates that experienced graders do not differ too widely in the application of present grading standards. However, the fact that there is variation in grading brings up one of the very real problems in any widespread adoption of the rail grading method of marketing. Uniform application of standards need to be made to individual carcasses within any one plant and as between plants.

However, in this particular study, the percent of the variance between prices paid and the actual value of the lambs that can be ascribed to grade error was quite small. An analysis of price variance has been made for only three lots to date. The buyer overvalued Lot I an average of 70¢ per

cwt. Lot II was overvalued 20¢ per cwt and Lot III was undervalued \$2.85 per cwt. The results are presented in Table I.

TABLE I. PERCENT OF VALUE VARIANCE FROM DIFFERENT SOURCES¹

	Lot I	Lot II	Lot III
Grade error	3 9%	3 7%	4 5%
Yield error	74 2	79 8	77 7
Interaction of grade & yield errors	21 9	16 5	17 8

¹ The basic equation for this determination was $\sigma_T^2 = \sigma_g^2 + \sigma_y^2 + 2\gamma_{gy}(\sigma_g\sigma_y)$.

Approximately 75 percent of the value variance was due to yield error which would be entirely eliminated under the carcass grade and weight method of marketing.

These tentative results reveal a weakness in the present pricing mechanism for slaughter lambs. There is a tendency to generalize prices paid instead of returning to each individual producer the true value of the product delivered. The seller of top quality, high dressing lambs tends to be underpaid and the seller of low quality, low yielding lambs tends to be overpaid.

It is important to note however, that before we know the true possibilities of this method of marketing we must consider not only its desirability but also its practicability. There are a number of problems that need to be solved before the question of practicability can be answered affirmatively. These problems include a satisfactory method of identification, the effect on slaughtering costs, a method of adjusting for differences in by-product values, the extent of tissue shrinkage when animals are held various periods of time before slaughter, and some others. The results of studies to date indicate the need for further research in this field both to further test the results obtained thus far on the desirability, and to shed light on the relatively unexplored problems on the practicability of rail grading.

DISCUSSION*

MARVIN A. SCHAARS

University of Wisconsin

If we adopt the hypothesis that producers of livestock should be paid for their slaughter animals according to their individual values, then investigation as to whether existing pricing methods achieve this goal is a good starting point. Our objective in this study was to see whether inequalities in pricing to individual producers for the same grade of livestock exists, whether the inequalities, if found, are of such magnitude and importance as to warrant serious consideration of a different system of pricing, and equally as important, whether under American conditions of livestock

* A paper given at the Annual Meeting of the American Farm Economic Association, Green Lake, Wisconsin, September 14, 1948.

marketing it is practical and economical to change to some other system of pricing.

In many respects the problems which Dr. Dowell and Mr. Engleman faced with slaughter cattle and hogs were more complicated than and different from those confronting us in our study of veal calves. A majority of the cattle included in their study was purchased on a carcass weight and grade basis, and hence, a liveweight price was not negotiated on the animals. The *probable* liveweight price was therefore estimated. In our study, the liveweight prices paid by the packers were obtained. Also, the carcass prices for steers and heifers were computed on the basis of Chicago wholesale beef prices whereas in our study carcass values were based upon the packers' quotations for veal carcasses on the days the carcasses were sold. We did not face the necessity of determining objective grade standards for veal carcasses as was necessary for hog carcasses. Veal, as you know, is sold in carcass form by the packers. Wholesale quotations on the basis of U. S. Grades are used in the trade. Veal is not aged, and sales and shipments were made soon after slaughter, generally the following day. Live prices and wholesale carcass quotations can, therefore, be readily adjusted to one another since there is such rapid turnover of the meat. I should add, however, that we did not ascertain to what extent grades and prices the packers placed on the carcasses differed from the federal grader's grades and from the daily wholesale quotations. To the extent that such changes were made, the actual gross receipts to the packer would differ from the carcass values as we computed them.

Without attempting to describe the procedure of carrying on the tests at two packing plants in the state, I shall briefly review the major tentative findings. The estimated yields of the two buyers varied considerably from the actual dressing percentages. At one plant where 420 calves were checked, the buyer estimated the yield correctly for 14% of the calves, overestimated the yield for 23% of the calves by 1% to 9%, and underestimated the yield for 63% of the calves by 1% to 15%. At the other plant the record was not as good, for there the buyer estimated the yield correctly for only 7% of the calves, overestimated it for 11% of the animals by 1% to 16%, and underestimated the yield for 82% of the calves by 1% to 11%. At the first plant the buyer estimated the yield within 2% + or - the actual yield for one-half the calves, but at the second plant the yield for only one-third of the calves was estimated that closely.

In comparing the estimated grades with the carcass grades as determined by federal graders, considerable variation in the competence of the two buyers was shown. The buyer's estimated grades and the official grades coincided for 33% of the calves at one plant and for 61% at the other plant; were below the official grade for 3% of the animals at one plant and for 20% at the other; were above the official grade for 64% of the calves at the first plant and for 19% at the other plant. At the first plant where two-thirds of the estimated grades failed to agree with the official grades, most of the misses were by one grade, some by two grades, and a few by as much as three grades. But, at the second plant only 3% of the estimated grades deviated from the official grades by two grades. In other

words, 97% of the estimated grades were the same or within one grade of the official grade, which strikes me as quite skilful grading especially in view of the fact that carcass grading is done on a subjective basis where skilled graders may disagree on borderline cases

At both plants considerable variation within each grade was found in the amounts paid for live animals from the wholesale values of carcasses used as a base. Much greater variation was found for the two lower grades than for the two higher grades.

Conclusions

According to this study, it is evident that considerable variation existed in the returns that individual farmers received for veal calves of equal grade at the two plants. Even at the plant where the buyer was fairly proficient in grading and had a better record in estimating the yield than was done at the other plant, the prices paid farmers failed to provide equality of treatment. Dealing with two variables, yield and grade, and then determining a price which gives proper weight to each factor is unquestionably a difficult matter for a busy buyer in the yards even though a conscientious effort is made to treat each patron equitably. Pricing errors due to miscalculations of yield could be entirely eliminated if carcass weights rather than live weights were used. Likewise, miscalculations of the grade could be reduced considerably by examining the carcass rather than the live animal. From the producer's standpoint, the desirability of having a pricing system for veal calves that would reward individual farmers more nearly for what their calves are worth to the processor is apparent. From the packer's standpoint such a pricing system might also be definitely advantageous. This would not mean that more money would be paid for veal calves by all packers but that a more equitable distribution of that paid out would be accomplished. The pie would merely be cut differently.

Our study, like that of Dr. Dowell's, has not explored the practical problems that would need to be solved before a different system of pricing could be instituted. He has mentioned a number of them. Our research findings point out strongly the desirability of a change in pricing procedure but leaves for further investigation the solution of the practical considerations involved.

ROUNDTABLE ON FARM LABOR

Chairman: John D. Black, Harvard University

CAPITAL-LABOR SUBSTITUTION IN COTTON FARMING*

KENNETH L. BACHMAN

Bureau of Agricultural Economics

SUBSTITUTION of capital for labor has been a characteristic trend of the American economy. In this process of increasing efficiency and decreasing costs, cotton farming has lagged behind most other types. One of the reasons for this lag has been the difficulty of mechanizing the cotton enterprise. The introduction of machinery has made great changes in production of wheat, corn, and many other major crops, but the development of similar machines for cotton has been more difficult. The immobility of the farm population in cotton areas and its relatively high birth rate have been additional problems. But cotton farming seems now to have entered into a period of rapid technological change.

The process of substituting capital for labor in cotton farming may be divided into two general classes. (1) Shifts to enterprises which use more capital relative to labor, and (2) substitution of capital for labor in the existing types of farming

Capital-Labor Substitution by Changing the Type of Farming

The process of shifting to other types of farming has been going on for more than two decades. In the ten southern States, the proportion of cash farm receipts coming from enterprises other than cotton increased from 38 percent in 1924 to 74 percent in 1946. On many farms this has meant elimination of cotton. With the exception of tobacco and a few specialties, these changes have been in the direction of enterprises using more capital in relation to labor.

In many areas a continued increase may be expected in the importance of other enterprises. Important technological advances have been made in many enterprises including. new varieties, improved fertilizer and cropping practices, and mechanical methods of production. In some areas especially they are changing the comparative advantage of the various enterprises.

* A paper given at the Annual Meeting of the American Farm Economic Association, Green Lake, Wisconsin, September 14, 1948.

Capital-Labor Substitution on Cotton Farms

Possibilities of substituting capital for labor in those farm organizations in which cotton remains the major enterprise depend in large part upon progress in cotton mechanization. Recently considerable progress has been made in the mechanization of some preharvest operations, and future changes are on the horizon. From 1939 to 1946, for example, the proportion of cultivating and planting done with tractors rose from 21 to over 40 percent.¹ But progress in mechanizing all the operations on cotton has been limited. The two key operations, hoeing and picking, remain relatively untouched. In 1946, less than 1 percent of the cotton was harvested by mechanical methods.²

Mechanization to date may be characterized as "partial" rather than "complete." Completely mechanized methods have been used only in certain areas and there partly in response to the unavailability of labor when needed. Completely mechanized methods will gradually increase in importance. But future technological improvements in methods and machines will determine in part the rapidity of the general adoption of completely mechanized methods.

The extent to which farm operators in specific areas can incorporate specific technological developments, the types of capital-labor substitution that may be profitable, and the opportunities for off-farm employment of the labor released might well be focal points for much of the research in the years immediately ahead. Extension and action programs based on such research can greatly reduce the problems and mistakes in this period of transition.

Effects of Capital-Labor Substitution

Shifts to other enterprises as well as partial and complete mechanization in cotton farming *all* seem likely to be of importance in the years ahead. Where these shifts are limited to partial mechanization, some increase in size of farm and amount of supplementary crops seems likely. In some cases, partial mechanization may add to the seasonal leisure or underemployment of operators and of farm wage workers. This may increase the problems of effective utilization of labor especially under depression conditions. Complete mechanization, where practicable, can greatly increase the size of

¹ A. P. Brodell, *Use of Tractor Power, Animal Power, and Hand Methods in Crop Production*, U.S.D.A., B.A.E., F.M. 69, July 1948, P. 26

² *Ibid*

farm and it could cause a trend toward specialization in cotton production. Adoption of types of farming which use more capital relative to labor will also encourage larger farms. More employment for the remaining farm families often will be provided through a better seasonal distribution of labor.

Prospective trends in substituting capital for labor will gradually change the farm labor picture. Shifts to other types of farming as well as shifts to completely mechanized methods of cotton farming will reduce significantly the numbers of farm operators and the seasonal and year-round labor needed in these areas. These changes are also likely to increase the importance of family farms. Partial mechanization will reduce the numbers of farm operators and year-round labor needed, but it may increase the importance of seasonal labor.

Incomes and Resources

The wise substitution of capital for labor can be an effective means of narrowing the gap in incomes and resources of people engaged in cotton farming, as compared with those engaged in other types of farming. Individual farmers are often in position to reap a double advantage by making such technological shifts. Not only is the output increased but total costs per unit are often significantly decreased. For example, the operator of a representative large cotton farm in the Southern Piedmont of North Carolina could almost double his output. At the same time he could reduce by more than one-third per unit costs exclusive of management and labor performed by the operator and his family.³ Changes in technology enable individual firms to *shift* to new and lower cost curves and to increase output as well.

These changes would be made possible by shifting from a cotton system to a fully mechanized livestock small-grain system and by using improved practices. Substitution of capital for labor on this farm would result in the displacement of two sharecropper families.

One argument commonly advanced is that the capital-labor substitution by increasing production, especially salable production, will reduce prices and all or most of the benefit will flow from the people engaged in cotton farming to other groups. The importance

³ W. W. McPherson, W. H. Pierce, R. E. L. Greene, *Farming Opportunities, Southern Piedmont Area, N. C.* In press. Estimates of production and costs based on 1985-89 prices.

of these effects can be overemphasized.⁴ In the first place, a large part of the increased production seems likely to be in products other than cotton. Cotton farmers are but a minor group in the production of most of these products. For example, increased production of livestock by cotton farmers would not be expected to reduce prices of livestock proportionally. Increased production under these conditions also means larger returns to cotton farmers. On the other hand, when shifts in cost curves are involved, total costs may be less for the larger production than for the smaller. Reduction of about one-fourth in the physical costs per unit of agricultural output in the United States since World War I illustrates the aggregate importance of these shifts in cost curves due to technological change.⁵ Finally, not all capital-labor substitution in cotton farming will result in any over-all increase in agricultural production. Mechanization of cotton hoeing and chopping, for example, may merely save labor without directly increasing total production.

Substitution of capital for labor can increase the returns per combined unit of capital land and labor used in these areas. Will living standards rise to absorb most of these gains and to prevent capitalization into higher land values? Historically, over the longer run, per capita incomes of the labor remaining in an industry have been increased under these circumstances. Certainly the ability of the farming units to pay higher wages for the labor needed will be improved. Further, development of increased skills and responsibilities will improve the quality of labor. But the need for farm labor will steadily decrease and a substantial stream of migration to nonfarm jobs will be necessary. The welfare of the labor released and of the labor remaining in agriculture will be greatly affected by economic conditions and policies. The problems can be eased if off-farm job opportunities are widened by: (1st) Facilities to encourage those inclined to obtain necessary skills and training for nonfarm work; and (2) full development of industrial resources, especially in areas in which farm labor needs are being significantly reduced.

⁴ See, S. E. Johnson, "Agricultural Production After the War," J. F. E., Vol. XXVII, No. 2, May 1945.

⁵ M. R. Cooper, G. T. Barton, A. P. Brodell, U.S.D.A. *Progress of Farm Mechanization* B A.E. Misc. Pub., 1947, P. 64.

AN ANALYSIS OF THE ECONOMY OF USE OF FARM LABOR IN THE CORN BELT*

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THE cooperative project to study the use of labor on cash grain farms in East Central Illinois and North Central Iowa is being conducted by Harvard University and the Division of Farm Management and Costs of Bureau of Agricultural Economics. The objectives of the study are to find how labor and capital are being combined and used on selected kinds of cash grain farms and to determine what kinds of organizations would be best suited to the different kinds of labor forces on such farms. The project is only partially completed, with little analysis having been done.

Selection of the Farms

The Bureau of Agricultural Economics in cooperation with the Illinois and Iowa Experiment Stations conducted a survey in the two cash grain areas early this year to determine costs, returns, and practices on cash grain farms for 1947. The Statistical Laboratory of Iowa State College drew samples to contain 1/96 of the Illinois cash grain area and 1/30 of the Iowa cash grain area. Presumably these samples contained similar proportions of the cash grain farms of the areas within the limits of sampling error.

All of the farms in the small scattered sampling segments were first visited to determine if they were cash grain farms or some other type. A schedule of the physical characteristics of the farms was used to determine the type of the farm. This definition will correspond only approximately with the census definition of cash grain farms which is based on income, but it is believed to be satisfactory as a simple method of determination. All cash grain farms of over 220 acres were enumerated, but only one half of the smaller farms were enumerated. In order to obtain enough returns from large farms there would have been far more from the small farms than were needed if all of them had been enumerated.

When the schedules had been returned and edited, they were then stratified into nine different labor force types, depending on the kind of workers, the length of time worked, and the number of

* A paper given at the Annual Meeting of the American Farm Economic Association on Green Lake, Wisconsin, September 14, 1947.

workers. Four of these groups were designated as "major" types and four were designated "minor" types. The minor types were combinations or variations of one or more of the major types. The ninth class included farms that did not distinctly fit into any class and closely resembled two or more classes.

Farms were then drawn at random from each strata. In each state equal numbers of farms were drawn, so that they could be first treated as separate universes and later as a single universe. *In that manner, differences between the two areas might be discovered.* In each state twelve farms were drawn for each major type and six farms were drawn for each minor type. The subsample covered slightly more than one fourth of the original sample.

The method of selection gives a different sampling rate for each labor type classification, but this is believed to be more desirable than a constant sampling rate which would give an insufficient number of large farms to draw reasonable statistical inferences for some of the labor force types. Further, the low proportion of large farms that would be obtained with a constant rate would not give many farms where labor and machinery are likely to be used most efficiently. A larger sample would have been desirable, but time and funds did not permit greater coverage. In fact, the number of farms was larger than originally planned.

Collection of the Data

A schedule was developed which would permit the enumerator to determine the work that had to be done on each farm and the methods of doing it. Once this was determined, it was used as a guide to discover how an operator was able to do so much work or why he was not able to accomplish more. This type of questioning was not suited to a formal questionnaire using objective answers. This meant that the enumerator had to make an evaluation of the answers on the basis of the previous information of the farm, so that farms might be compared.

Those operators who had changed the character or scale of their operations during the past two years were especially questioned on why changes had been made and how they felt the changes were working. Problems peculiar to individual farms such as ditches, wet areas, and irregular fields were given attention.

The second source of information will be the individual schedules which were completed on the original survey. The practice data

gives a great deal of information on how work was done on the farms. It also gives information on the buildings, machinery and labor force that will aid materially in the analysis.

Analysis of the Data

The analysis of the data will be divided into two parts. The first part will find how well farms have been using their labor and capital. This will also indicate the range of differences that exists between farms, which preliminary examination suggests is rather large. This will also be compared with the plans farmers would like to carry out if they were able to procure the materials, labor, and equipment they desired. Again, a superficial examination suggests that the range will remain very wide.

The second objective is to determine what can be done to provide better organization for cash grain farms by using labor, machinery, and buildings in the most suitable combinations. In this study, the labor force has been considered fixed, so we are asking what combination of land and capital (including sizes and types of equipment) will best fit the labor force. This means how much land can one man, for example, handle and what sizes and kinds of equipment can he best use. What kinds of machine work would it be better for him to hire because the overhead is too high? This will be carried out for each of the eight labor forces studied.

All farms will be studied and efficient operations will be segregated. There are doubtless efficient operations on all farms mixed with varying numbers of inefficient ones. Therefore, no single farm is likely to serve as a model for most efficient operation. If the methods of several farms can be studied and the most efficient methods of all farms selected for each operation, there may result a model more efficient than any single farm studied. This will require the construction of eight different models of operating units representing each of the labor force types.

Analytical Problems Encountered

There are some problems that will make the analysis difficult and may limit the application of some of the conclusions to special cases.

First, weather conditions play a large part in determining the manner in which an operator and his labor force may be able to accomplish timely operations. Weather may cut down yields because too much land was farmed compared with the other factors of

production in a wet year. On the other hand, in a dry year, the factors could handle more land quite well, thus being underemployed. This problem may be handled quite well if there are few extremes in weather conditions giving a leptokurtic distribution or even something resembling a normal distribution. If, however, there is wide variation in weather conditions from year to year, then the problem cannot be handled very satisfactorily by any method except by holding excess factors as a reserve for the frequent bad year. This seems to be practiced frequently in the area surveyed.

The second problem concerns the relative prices of the different factors of production, and these relative to the value of the product. If the relative prices of the factors and crop income were reasonably constant, the proportions of each factor used should remain about the same. Therefore, if prices remain the same relative to each other, though they may change, or if the fluctuation of relative prices is small, the problem is not serious. When the fluctuations are very large, the proportions of each factor should change from time to time. The problem does not have an easy solution in this case, but requires a sort of "mean solution" which is likely to be wrong the fewest possible times. Here wide fluctuations are believed more likely than for weather conditions, making this problem seem more serious.

The third problem concerns the change in the quality of the operator's labor with age. A young man can work longer hours and can do more heavy work than an older man. Therefore, how can a one man farm keep a young man fully employed without overtaxing his physical capacities when he is about to retire? Some farms have decreased the amount of work by reducing the livestock or the acreage farmed. Usually, this has meant that the capital has been underemployed, either in the form of unused buildings or in the form of more power and machinery than is required. In some cases, it has taken the form of an increase in the size of the labor force, which frequently means that labor is underemployed because the labor force does not fit the machinery and land. This problem may present difficulties for the "one man farm" though there seem to be possibilities that a satisfactory solution may involve doing custom work when the operator is young and hiring it done when he is older. For other farms, a staggered age of laborers may give a constant labor force.

FARMER-WORKER RELATIONSHIPS*

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EVERY farmer has a labor problem. This is as true for one who is the only source of labor on a farm as it is for the large operator with many hired workers. Both have the problem of using labor as productively as possible. The lone operator has no problems of farmer-worker relations, but his situation is often more difficult with respect to ways of increasing his productivity since his labor supply may be fixed.

Although high productivity of labor is a basic requirement for all farmers, this paper will deal entirely with farmer-worker relationships. Emphasis will be placed upon relationships with hired workers. Most of the same principles apply, however, to unpaid family workers and in some instances to the farm operator himself.

Employer-employee relationships have been of concern in industry for a much longer period than is true in agriculture. Courses in human relationships are now available in schools dealing with industrial and labor relations. Numerous studies have been made and books have been written on the subject.

Agriculture has given but little attention to employer-employee relations. The principal reason is obvious. Until World War II, supplies of farm labor were generally available at what now appear to have been ridiculously low wages.

World War II, however, changed all this. There are some who have anticipated that peace-time conditions would bring a farm labor situation similar to that of the 1930's. Such a development has not occurred. Many farmers have found it as difficult to get and keep good help since the war as it was during the war.

To help answer the question, "How can I get and keep good help?" which was being asked repeatedly by farmers in New York, a study was made of 58 farmers and their "regular" or year-around hired workers in an intensive dairy area in Rennselaer County on the eastern border of the state. Information was obtained by the survey method on practices being followed by farmers in their labor management and on factors which the farmer and hired men

* A paper given at the Annual Meeting of the American Farm Economic Association, Green Lake, Wisconsin, September 14, 1948

considered important in successful relationships. Farmers and hired workers were interviewed separately.

Among the questions asked, was the following. "Based on your experience, what are the most important things for a farmer to keep in mind if he wants to get and keep good hired help?" Each farmer and worker was asked to list the points in the order of importance. No check list was used. Points mentioned by each farmer and worker were recorded in his own words and later summarized and classified as in the table below.

FARMERS' AND WORKERS' SUGGESTIONS FOR GETTING AND
KEEPING "GOOD" HIRED HELP
58 Farms, Northern Rennselaer County, New York, 1946-47

Suggestions	Times Mentioned by		Rank by	
	Farmers	Worker	Farmer	Worker
Maximum of privileges	38	33	1	1
"Treat like human beings"	29	26	2	3
Pay good wages	25	29	3	2
Reasonable and regular hours	14	24	4	4
Work with men	12	5	5	9
Careful supervision	12	17	6	7
"Don't drive or be overbearing"	11	5	7	8
Time off	8	18	8	6
Show interest in workers	8	4	9	10
Mechanization	7	18	10	5
Vacations	3	3	11	12
Good working conditions	3	2	12	13
Good management	3	4	13	11

A maximum of "privileges" was mentioned most frequently by both farmers and workers. For married men this meant the use of a house together with varying amounts of farm-produced food and fuel. The size, condition and amount of modernization in a "tenant" house seemed important not only to hired workers but to their wives and families. Privileges for single men usually meant board, room, and laundry in the farm operator's home. Some single men volunteered the information that the farmer's wife's cooking was an important reason why he liked his job.

Farmers placed treating their hired men like "human beings" in second place; the workers ranked it third. "Fair treatment" and "following the Golden Rule" were classified under this general heading. Several farmers referred to unsatisfactory experiences which they had had as hired men.

The paying of good wages was ranked third by the farmers, but second by the hired men. "Good" wages meant the average of the community or higher. Hired workers point out that prompt payment of wages in full was essential. Several also pointed out that while good wages were important, other things were also necessary. One-half of the farmers were paying their wages weekly; formerly payment was once each month.

Keeping reasonable and regular hours was ranked in fourth place by both the farmers and their hired workers. It was pointed out frequently that a definite quitting time, which was strictly adhered to, was highly desirable.

According to farmers, the other important factors in the order of their importance were: Working with hired men, providing careful supervision, avoiding "driving" or being overbearing, giving time off, showing interest in their workers' personal affairs, having adequate farm equipment, giving vacations, providing good working conditions, and having a well-managed farm business.

All of these points were also mentioned by the hired men. Some of them, however, were ranked in different positions. For example: Farmers placed mechanization tenth, but the hired workers placed it fifth.

Some of the specific practices of the farmers in managing their hired help were rather significant. One-fifth of the farmers were paying bonuses or sharing profits. On the average the farmer worked 60 percent of the time with their men. Almost two-fifths of the farmers were giving at least one-half a day off each week. One-fifth of the farmers granted sick leave with pay for an average of 16 days per year. One-sixth of the farmers gave an average of two weeks vacation with pay each year. Almost one-half of the remaining farmers gave an average of 13 days per year with pay for attending auctions, going hunting or fishing, and transacting personal business. Although insurance against accidents is not required in New York, 30 percent of the farmers were carrying workman's compensation insurance or farmers liability insurance with medical payments.

Although several important essentials for successful relationships were highlighted, it appears that maximum success requires a combination of many things which may appear unimportant individually, but which when taken together, are extremely significant, especially to the hired man.

This survey was designed as a pilot study to help develop plans for more comprehensive work in the future. Any plans which are made will include the following .

- (1) Obtaining a much larger number of records.
- (2) Obtaining records in several different counties.
- (3) Including some farmers who have been unable to keep hired help.
- (4) Developing an objective measure of the degree of success in farmer-worker relationships. Numerous methods were tested with these data, but no satisfactory single measure was found. The rate of labor turnover, the average years the present worker had been on the farm, output per man, and numerous others proved unsatisfactory. Possibly larger numbers of records will provide the basis for a satisfactory measure.

THE FUNCTIONAL APPROACH TO EFFECTIVE FARM LABOR UTILIZATION*

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EFFECTIVE use of labor is generally taken to mean high productivity per worker. To obtain maximum output per unit of labor input, careful consideration of all resources entering into farm production—not just labor alone—is necessary. Therefore, how well labor is used depends upon (1) the quality and amount of physical, economic, and human resources available and (2) decisions on farm organization and operation ranging from those pertaining to enterprise combination and size of business to equipment choices and work methods.

This discussion, however, is limited to farm operations. It is assumed that for a given farm the land resource pattern is set and that decisions regarding general farm organization are made. We are thus limiting ourselves to the problem of how to perform the necessary work. Based upon our experience in work simplification research,¹ it seems to us that the problem may profitably be approached in this manner.

1. *Classify the work into the necessary functions which must be performed.* For example, to produce livestock it is necessary to perform the functions of roughage and bedding handling, feed handling, provision of water, moving of animals, and manure removal. In the cases of roughage, grain, and bedding the performance of the function extends from harvest through storage and feeding. The functional classification is thus on the basis of complete processes rather than on an enterprise, job, or seasonal basis.

2. *Develop detailed standards or input-output ratios* (for labor, machines, equipment, and buildings) for different ways of performing each step in the process involved. These standards or ratios should be in physical quantities (as accomplishment per unit of man or machine time or minutes per ton or per acre), should carefully define the method and the working conditions, and should

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¹ Lowell S. Hardin and R. M. Carter "An Analysis of Work Simplification Research Methods and Results," this JOURNAL, Vol XVIII, No. 1, February, 1946, pp 320-330.

carry a quality determination (where pertinent) for each step in the process.

3. *Work out the most effective means of performing each function for "type" situations.* This step is accomplished through analysis and manipulation of the standards. (a) by direct comparison of different methods and complements of equipment for each part of the process, (b) by the budget or substitution method, and (c) by synthesizing new processes or means of performing the necessary functions. It is at this point that principles of work simplification or labor economy should be applied to improve existing methods wherever possible

4. *Test conclusions under actual farm conditions.* This suggested four-step procedure raises certain questions which we can discuss briefly.

Why the emphasis on functions? Because the functional approach cuts across enterprise lines, it should result in an answer most economical for the farm as a whole. This may be quite different from the answer obtained by studying one enterprise alone. For example, while hours of hay-chopper use may be too small for economy when hay alone is considered, additional use for straw and silage may make the machine a practical consideration.

Is the collection of physical data—standards or input-output ratios—the task of the economist? Properly, this is technology.² Because these data are essential to more refined economic analysis, however, the economist will probably have to assist, at least, in obtaining them. These data can probably best be obtained in three general ways. (1) from carefully selected case studies, (2) from controlled experiments (simulating farm conditions) performed in cooperation with agricultural engineers and production scientists; and (3) from well designed purposive surveys.

The controlled experiment has much to offer in this type of research, both in collecting data and in checking results. Actual observation and careful measurement are necessary. In this connection, professional farm management organizations are often willing cooperators. They frequently can provide cases for observation and farms on which to test conclusions.

Whatever the method of collection, the file of standards or input-

² For a more complete discussion of this question, see Earl O. Heady "Models in Farm Production Economics Research," this JOURNAL, Vol XXX, No 2, May, 1948, p. 210.

output data will never be fully adequate. It is time, however, that a start be made in this direction. Results—standards or input-output ratios—if carefully defined, can have wide use. No one state or area need build up all its own standards. In using these standards for budgeting and synthesizing methods, some adaptation of data or estimation is usually necessary. But this is not uncommon. Even feeding standards, which we generally accept and use, also require judgement in their interpretation.

We can say, therefore, that the four-step procedure outlined above provides: (1) a basis for reasonably accurate cost comparison of methods; (2) a systematic means for developing improved work processes; (3) a definite planning and scheduling aid; and (4) a research method which is creative and forward looking. The results of this research should provide the farmer not only with facts on which to base his decisions, but also with some specific suggestions in the area of farm operations.

Management engineers and economists in urban industries are applying the same basic principles and laws that obtain in farm management. In many instances, industry-developed standards and input-output ratios of the general type suggested here have been used effectively. Agricultural management people have contended that farming is too diverse and variable for accurate use of standards or specific input-output ratios. On analysis, however, differences between urban industry and farming are frequently more apparent than real. Based upon industrial experience and farm work simplification research, it appears that analysis of farm work by functions and the development of standards or input-output ratios for farm work and farm equipment can provide needed fundamental facts. Intelligently applied, such a functional approach can make a real contribution to more effective farm labor utilization.

CANADIAN AGRICULTURAL MANPOWER PROBLEMS*

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CANADA is faced today, just as is the United States, with a generally tight labor situation. With present and prospective national income and investment in both countries higher than during the war years, it is to be expected that employment would also be high. In view of these trends, as well as the established "full employment" policy of the federal government, the prospects are for continued high employment for some time.

Faced with this situation the question arises, can agriculture be expected to secure the manpower it needs in competition with other expanding industries? An answer may suggest itself immediately; with the high demand for food products and the improved prices for most farm commodities, farmers can offer wages as attractive as other industries, and thus, especially today with increased farm mechanization, they should be able to meet their labor needs merely by encouraging fewer of the "surplus" farm workers to leave agriculture each year.

The solution is not quite so simple as this answer might indicate. In the first place, even though farm prices are relatively high and farm wages have risen correspondingly,¹ it does not follow that workers will be attracted to agricultural jobs or that all of those already in agriculture will wish to remain. There are strong indications that as long as jobs are available in urban industries workers from agriculture will be attracted to them. Comparable wages in farming will of course be an offsetting consideration, but such items as year round jobs, unemployment insurance, workman's compensation, superannuation, better housing and urban living are likely to be, individually or collectively, over-riding considerations "pulling" towards city or town employment. A number of well-known "push" forces operate in the same direction.² These include farm mechanization, long hours of work, isolation and frequently

* A paper given at the Annual Meeting of the American Farm Economic Association, Green Lake, Wisconsin, September 14, 1947.

¹ The index of farm prices of agricultural products, based on 1935-1939=100, stood at 204 for 1947 for Canada, and at 259 for the United States. The monthly farm wage without board had risen by the spring of 1948 to \$113 in each country.

² cf "Factors Conditioning Innovations in Agriculture" by John D. Black, *Mechanical Engineering*, March, 1945 pp. 181-182.

poor living conditions. Some improvement from the standpoint of agriculture, especially in commercial farming areas, has occurred in some of these latter items during recent years, but with better communication, including radio and rural film, farm workers are becoming more informed of conditions of employment elsewhere. The mingling of rural and urban youth in the services and in war-time employment worked to this same end.

In addition it should be noted that the birth rate in commercialized farming areas is frequently as low as, if not lower than it is in urban centers, in fact in some specialty farming areas, even with the reduction in labor needs accompanying mechanization, it is doubtful whether farm families with present rates of reproduction could supply all the labor needed, that is assuming all remained in agriculture³

Some workers, it is true, might move from subsistence farming areas but, even with special inducements introduced during the war years, not many persons from such areas went to other agricultural districts. Thus, when many of those for whom it would be advantageous economically to move, do not do so and when both pull and push forces are at work on those in commercial farming areas, there is not much prospect of reducing substantially farm labor shortages through any slowing up of the rural-urban flow of workers; in fact as long as high level employment continues it appears that the trend will be in the other direction

If then there is not much prospect of assistance in meeting farm manpower requirements from other industries under full employment conditions, where else can aid be obtained for those farming areas where shortages of labor occur? There are at least three other possible approaches which need examination. These are organized shifts of farm workers, experienced agricultural workers from other countries; and improved use of labor.

Organized Shifts of Farm Workers

Considerable success was achieved in Canada during the war years in arranging controlled movements of farm manpower on a seasonal basis. These movements, developed by the Department of

³ *What's ahead in Farm Labor?* by George W. Gill, Farm Labor Program, U.S. D. A., 1947, p 8; in six representative southern Ontario counties in 1946, namely Middlesex, Brant, Halton, Waterloo, Hastings and Carleton The birth rate in the rural areas ranged from 16.3 to 24.0 per 1000 population, while the rate in the urban areas ranged from 26.1 to 30.3

Labor under the joint Dominion-Provincial Farm Labor Program, are continuing during the post war period. The principle which underlies these organized movements is that it is in the national as well as the individual's interest to encourage workers who can be spared for a short period in one area to move to another area where their services are needed. A number of safeguards are introduced for the protection of employers, both in the supplying and receiving areas, and of the employees. These include no transfers unless local supplies of labor are insufficient; quotas for the number of volunteers in each locality; approval only of applicants who are physically fit, experienced farm workers, guaranteed wages at current specified rates; submission of employer's applications in advance, screening these applications to ensure that labor is sent first to those farms most in need of it, and continuous daily contact between recruiting and receiving areas to ensure that the forces of supply and demand, which in these cases operate as many as three thousand miles apart, are kept in as close adjustment as possible. These organized movements include several between provinces and between the United States and Canada, but perhaps the best example of this regulated farm labor market is the two-way movement of young workers between the Prairie and Central provinces.⁴ The eastward movement for haying and early harvesting in Ontario takes place in the early summer after grain is seeded and summer fallowing is well advanced on the Prairies, the westward movement for grain harvesting on the Prairies takes place between August 15 and September 15 as work in Ontario and Quebec begins to slacken and the harvest work in the West is getting into full swing.

These organized transfers of labor to meet urgent seasonal needs have proved valuable in making labor more mobile and in effecting a better over-all allocation of manpower on the farm. It is generally agreed that the quality of the workers moved under these plans is higher than under earlier, more haphazard migratory movements. The planned organization of the labor market also results in less waste of time and effort for both employees and employers, as well as creating less disturbance to the areas from which the workers are drawn than would be the case otherwise. Besides

⁴ In 1947 there were twelve major organized movements, involving approximately 20,000 workers six of these movements were across the international boundary

achieving the immediate objective of meeting farm labor requirements with qualified workers, the individuals participating in these movements are able to increase their annual earnings and to obtain useful experience in agriculture in another region. Considering the over-all gains obtained from these movements, travel assistance provided by federal and provincial governments amounting during 1947 to approximately \$20 per worker for each government does not appear excessive.

These organized shifts of farm workers appear at present to offer the best hope of meeting the seasonal needs of farm manpower where available urban as well as rural local labor is adequate. Over a longer period, however, the need for them may grow less. They are not as suitable, however, on the basis of present conditions to meet year round labor requirements. For these it is necessary to search elsewhere.

Experienced Farm Workers from Other Countries

The largest single source which has been found for year round experienced farm labor is Western Europe. This labor, which first became available in 1946, consists of three main categories. Polish veterans who fought for the allied armies under British Command, "displaced persons" located in the occupied zones of Germany and Austria; and interested workers, either as individuals or groups, from other western European countries, notably the British Isles and Holland.

The Polish veterans, who number slightly over 4,500, came to Canada under an over-all plan developed between the British and Canadian Governments. Selected from interested unmarried applicants, with experience in Polish agriculture, they each agreed to accept employment at current wages in agriculture as directed by the Canadian Minister of Labor, and to remain in agriculture, not necessarily with the same employer, for at least two years. The farm employers on the other hand submit written applications so that their needs can be appraised and their living and working conditions checked in advance. They must also guarantee year round employment at going wages in the community.

The plan, on the whole, is working well. A number of factors are responsible for this. Among these are: the eagerness of the men to become established in a new country, the care taken in matching their skills with the needs of their employers; and a systematic

placement follow-up by local National Employment Service and Provincial Agricultural Extension officers under the Farm Labor Program. This follow-up has enabled grievances to be removed before they become serious and prompt action to be taken in shifting veterans to other farms where this is in the best interests of all concerned.

Organized plans are also in operation for the farm workers now coming to Canada from the displaced persons camps, Holland and the British Isles. During the first half of this year over 6,000 single and married men, and single girls have been placed in agriculture in all of the nine provinces, from these western European sources.

It is too early to know what the long run effects of these immigrant groups of workers will be on the farm labor problem. It is well known that a large proportion of earlier groups of immigrants left agriculture at the first opportunity for urban employment in Canada or the United States. Steps are being taken under the Farm Labor Program to encourage those now arriving to remain on the farm but whether a larger number will wish to remain is uncertain. There appears, however, to be almost no limit to the number of Europeans who would like to come either to Canada or to the United States. The only serious question at present that has to be considered carefully is that the number of workers selected does not exceed the absorptive capacity of Canadian agriculture.

Improved Use of Labor

In addition to the organized transfers of workers to meet seasonal needs and the European workers largely to meet year round needs, a third approach to the problem of securing adequate manpower for agriculture and probably the one likely to be of most importance over the long run is a fuller utilization of labor already on the farm including more mechanization, wherever mechanization will itself increase efficiency.

Although notable improvements have occurred, labor efficiency in agriculture is still generally low. The loss of farm manpower during the war and the replacement of it by mechanization wherever possible have forced farmers to give greater attention to the use of labor. As a result more farmers today are recognizing that it pays to work out efficient methods of doing jobs around the farm just as much as it does to improve crop management or the care of of livestock.

One of the many ways in which labor efficiency can be increased is through greater stability of work on the farm. The provision where possible of more year round employment will contribute to this objective. Closely related is the need for suitable housing for employed workers. Inadequate housing and long hours of work are undoubtedly two of the most important factors militating against better labor utilization and giving rise to the exodus of manpower from agriculture.

Some steps have been taken under the Farm Labor Program in this field. These include the preparation of a two reel colored film entitled "Workers on the Land"⁵ and of a bulletin entitled "Better Farm Living for Workers on the Land"⁶ These and others similar educational efforts are made easier by the fact that the Farm Labor Program is a joint one between the federal Department of Labor and the Provincial Departments of Agriculture. The agricultural extension machinery of the latter departments is a logical avenue through which farmers can be approached on this important matter. The federal Department of Labor on the other hand, with its national perspective and its over-all concern with employment, is able to stress the bearing of efficiency on the allocation of all manpower and can draw on experiences of other industries in pointing to ways in which productivity of labor may be increased.

In conclusion it is clear that under present high level employment conditions the farm labor situation needs careful watching, just as it did during the wartime emergency, if manpower and other resources are to be used in the best interests of the country. When an increasing number of farmers have a large amount at stake in their crops and livestock; when there continue to be economic and sociological obstacles which make it hard for them to compete with other employers in the labor market, and when Canada has definite commitments to supply food to other countries, the problem of securing an adequate labor force can be left no longer to the old hit and miss methods. Workers, too, need some protection in the farm labor market, especially when they find themselves up against inferior living and working conditions about

⁵ Produced in 1947 by the National Film Board, Ottawa, in cooperation with the Federal Department of Labor and the Federal and Provincial Departments of Agriculture

⁶ Published by the Federal Department of Labor, Ottawa, 1948.

which, as individuals in the absence of union organization, they can do little.

The steps enumerated above, namely organized movements of experienced farm workers, importation of Europeans and the encouragement of better labor utilization, are helping to meet most of the current farm labor requirements in Canada. It is true, too, that they may point the way to beneficial longer run policies but it is recognized that they have not met all farm labor problems. Much more research is needed on farm labor and, besides, important changes in the position and organization of Canadian agriculture will have to come before satisfactory solutions to many agricultural manpower problems can be reached.

ROUNDTABLE ON LAND USE POLICY IN THE RIVER BASINS

Chairman Gladwin E. Young, Bureau of Agricultural Economics

POLITICAL AND OTHER PROCESSES IN FORMULATING AND IMPLEMENTING LAND USE POLICIES IN THE RIVER BASINS*

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POLITICS is conceived here as a struggle for power to control the personnel and direct the policies of government. The Missouri Valley will first be analyzed as an area of partisan strategy; later, the need for a political forum in the Valley will be suggested. The underlying assumption of a higher degree of rationality in politics than many will allow is reflected (a) in the premise that a successful developmental program in the Valley will redound to the advantage of the party receiving credit for it, and (b) in the assumption of a higher degree of responsible party leadership, that is, of control by the party over its individual members, than presently exists.

I. Partisan Strategy

1. The Missouri Valley and the balance of power between the parties

The area in which the Missouri lies, as the Populist revolt and the campaigns of 1912 and 1924 indicate, is politically independent—or so history says. Hence one asks: How significant is the area in the balance of power between the parties?

The chief pride of partisan politics is the Presidency. Omitting Iowa because of its traditional Republicanism in Presidential elections, only 50 electoral college votes remain in the Missouri Valley. Of these, Colorado, Kansas, Missouri, and Nebraska have 35. Examination of the popular vote in each of the 1928–44 presidential elections in these four states discloses very few narrow margins of victory; and in these few examples, the effect of a shift would have been negligible. Thus the Valley appears of little moment in campaign strategy concerning the Presidency.

What about the national House of Representatives (H. of R)? In the 29 H. of R. seats which lie “within the Valley,” there were 87

* A paper given at the Annual Meeting of the American Farm Economic Association, Green Lake, Wisconsin, September 14, 1948.

contests in the elections, 1942-46. Arbitrarily considering as "close" elections in which a five percent shift would have changed the result and "fairly close" those requiring less than eight percent shifts, we find 25 close and 14 fairly close elections out of 87, or 44 percent. Eliminating the nine close seats in Missouri, however, only 19 close and fairly close elections appear out of 57—or 33 percent. At most, 14 House seats appear subject to influence by either party successfully claiming credit for Missouri Valley development. Yet review of the last 14 Congresses discloses only three in which the margin of partisan control has been so narrow as to have made significant a "block" of close seats such as lie in the Missouri Valley.

The Senate 16 Senatorial seats are involved in Colorado, Wyoming, Montana, the Dakotas, Nebraska, Kansas, and Missouri. Using the same criterion as were applied to the H. of R., 16 close and 8 fairly close elections appear out of the 48 Senatorial contests between 1928 and 1946.¹ Since 1920 there have been 14 Congresses in eight of which a shift of ten Senatorial seats, or less, would have changed party control. The strategic importance of the Senate to both parties in the 1948 election has been reiterated. Long periods of precarious party control in the past (chiefly 1874-1896) add to the strategic significance of the Missouri Valley. Either party would profit considerably if it could markedly improve its chances of Senatorial victory in this great area.

Moreover, improvement of party discipline may be involved. The area in question has notably swelled the ranks of insurgents, as analyses of the Farm Bloc members of the early 1920's or their Progressive predecessors a decade earlier will show. Political insurgency, as well as political independence seems closely related to economic instability in the Missouri Valley; hence both may be mitigated by any program which markedly helps stabilize the regional economy. But this remark calls up two other issues: (a) the adjustment of urban and rural claims, and (b) the reconciliation of north-west south-east conflicts in the Valley.

2. Partisan strategy, urban and rural adjustments, and intersectional conflict

In the Dakotas, Nebraska, Kansas, Missouri, Montana,

¹ *Vote Cast in Presidential and Congressional Elections, 1928-44*, Dept. of Commerce, Bureau of the Census, 1946, *Congressional Directory*, 80th Congress, 2nd Session

Wyoming, and Colorado which, while not co-extential with the Valley, should offer a reasonable gauge of trends there, total population declined seven percent in 1940-45, according to the census. Practically all of this occurred within the farm population, which declined 22 per cent absolutely and from 33 to 28 percent as a proportion of total population. If uneven, the downward trend in farm populations has been marked in each of these states since 1920.

These figures suggest the wisdom for partisan strategists of favoring industrial and urban aspects of Missouri Valley development. This conclusion is generally borne out by W. E. Binkley's counsel to marshal electoral strength by calculated appeals to emergent groups and interests. Urging the Republicans to imitate the Democrats, he writes "No longer will it be quite so much a matter of carrying the East, the West, or the prairies, but rather that of luring youth and the labor and the urban vote." But beyond the manipulations for immediate partisan gains lie higher political considerations. In the *Politics of Democracy*, Pendleton Herring has urged the need to balance "ideas, interests, and institutions." If emergent interests are urban, industrial, and commercial, while political institutions favor rural interests, adjustments are indicated not merely in the content of public programs but also in the *forms* of political institutions.

Herring's counsel is based upon analyses as old as Aristotle, who found a cause of revolutions in the disproportionate increase of social groups or classes without corresponding adjustments in governmental forms. Yesterday's newspaper emphasizes the same point, respecting the progressive urbanization of Kansas. "On nearly every burning issue, the towns and cities have been lined up against the country." Urban interests are said to favor reform of the Constitution of 1859, but the rurally-controlled legislature (one representative from each of Kansas's 105 counties, however small) has defeated every move to call a constitutional convention.²

Some qualifications are necessary, however. Binkley appears

² Some of the conflicts reported are relevant as illustrations of the issues which have to be reconciled politically in any valley resource developmental program. "Cities and towns pay the lion's share of state taxes, but get the least in dollars-and-cents benefits. Urban areas are pressing for flood control projects, but farmers don't want their lands flooded by dams. Cities and towns want highways leading to their merchants. But counties fight the abandonment of every mile of obsolete roads." Peter Wyden, *New York Times*, 29 Aug. 1948, p. 6E.

generally correct in adjuring Republicans "to shift from the old emphasis upon the strategy of sections to the strategy of interest group diplomacy." Yet the Missouri Basin program is strongly, if by no means exclusively, sectional, moreover, there is an important sectional cleavage within the Basin—downstream interest in flood control and navigation as against upstream interest in irrigation.

A possible guide to party strategy under these circumstances is found in the significance of the area for control of the Senate. Otherwise, the issue might safely be arbitrated in favor of downstream interests. Most of the doubtful H. of R. districts are in Missouri, doubtful districts in Colorado and Nebraska are urban (Denver and Omaha), while, generally, the remaining rural H. of R. districts seem so safely Republican at present as to be possible for both parties to disregard—so far as the strategy of control is concerned. Again, the bulk of the population lying in the southeastern part of the Valley, would tip the scales in favor of this "section within a section." But six of the 18 Senators involved are in territory where irrigation constitutes a primary purpose, while eight more Senators have the difficult problem of adjusting conflicting interests within their own states. Consequently, the purpose of irrigation development is strong enough to demand and receive recognition.

3. *Summary*

For partisan strategy, the Missouri Valley is most significant with respect to control of the Senate although also of some importance regarding the H. of R. Equally, policies of either party for the Valley must consider trends toward urbanization and industrialization, trends which may be further stimulated by a comprehensive program of Valley development. An added complication is the inter-sectional issue over the use and management of the water. Urban versus rural interests, upstream versus downstream—these would seem enough without being worse confounded by considerations of partisan strategy for control of the Senate. From the analysis, it is obviously difficult for the parties to design programs which are successful strategically while also sufficiently appealing to win the support of the bulk of the interests involved. Yet the analysis ought also to underline the significance for society

of the political process from which some kind of answer is produced to pressing problems like the above.

II. The Significance of Political and Administrative Organization in the Missouri Valley

Descriptions of the evolution of the present Missouri Basin program dwell heavily upon the roles of private groups and interested governmental agencies as well as upon the action of Congress and the President. Consequent enactments, chiefly the Flood Control Act of 1944 and the Rivers and Harbors Act of 1945, are full of compromises. But behind the compromises are conflicts of organized interests.

Thus in the 1944 Act, Congress gave irrigation priority over navigation, yet, as Hart points out, the separate authorization in the 1945 Act of the 9-foot channel from Sioux City to the mouth of the Missouri leaves the situation confused. The compromise on administrative responsibilities further reflects the clash of groups and agencies. The Bureau of Reclamation (B. of R.) is given planning authority, and developmental authority as rapidly as Congress authorizes specific plans and provides appropriations, for the Valley west of the 97th meridian. The Army Engineers (AE) is given similar authority to the east. Generation of electric power is placed last on the list. Power is to be distributed by Interior, subject to Congressional conditions, including rate schedules as set by the Federal Power Commission. Federal investigations on watersheds and measures for run-off and water-flow retardation and soil erosion prevention are responsibilities of the USDA. Recreation development is divided between the Interior and the AE in their respective bailiwicks.

Congress has further required mutual submission of plans between the B. or R. and the AE as well as to the governors of the states concerned. The upshot has been administrative organization of the area by departments, plus establishment of inter-agency committees in Washington and in the Valley. The latter committee includes the state governors.

Numerous criticisms have been made of these arrangements.³

³ A penetrating criticism is Henry Hart, "Valley Development and Administration in the Missouri Basin," *Public Administration Review*, Winter, 1948, see also Charles McKinley, "Federal Field Integration and the Valley Authority," and William Pincus, "Shall We Have More TVA's?", same source, Aut., 1946, and Spring, 1946. C. Herman Pritchett has ventilated problems of national coordination

Yet, as most critics recognize, it is neither mere arbitrariness nor lack of imagination which produce the present unwieldy administrative organization, but rather the continued existence of unresolved conflicts. Among government agencies beset by difficulties, the worst off are commonly those charged with arbitrating differences among powerful "private" groups, associations, and interests. The significant thing about the Missouri Valley is that conflicts over the different uses of water are strong enough to keep controversy alive through all stages: proposals, debate, legislative sanction, planning, the securing of appropriations, and development.

From this it appears that no stroke of genius in perfecting administrative organization will liquidate the conflicts in the Missouri Valley. At the same time, the present program and its operation appear to deny certain important purposes the consideration that they deserve. Some of these under-emphasized purposes are power development, the integration of agricultural research and education with irrigation development, and the promotion of recreational facilities. Other purposes which may be neglected are epitomized by TVA's resource and development studies, e.g., studies respecting freight rates, the use of electric power for farms and industries, community planning, and health and sanitation as related to water use.

Reviewing the emphasis upon some purposes, at the apparent expense of others, one is tempted at once to espouse an MVA instead of the present organization. A Missouri Valley Authority could clearly be vested with comprehensive powers over the development, management, and control of the Missouri River and its tributaries.⁴ It would be legally possible to create an MVA with full powers of a "water-master," including power development; in addition authority could be granted to perform research and demonstration with respect to related matters like sanitation and

in "The Transplantability of the TVA," *Iowa Law Review*, A Symposium on Regional Planning, Vol 32, No. 2, Jan., 1947. This review carries a number of other articles of interest. Report #2, Public Affairs Institute, Washington, D. C. (1948), analyses 15 "unfinished tasks" in the Valley and relates shortcomings regarding most of them to imperfections in the conception, organization, and administration of the present program. See also Rufus Terral, *The Missouri Valley*, a lively account, with bibliography.

⁴ *U. S. v. Appalachian Electric Power Co.*, 311 U. S. 377 (1940) and *Oklahoma v. Atkinson Co.*, 313 U. S. 508 (1941).

health; fertilizer production, distribution, and use; erosion control; and the development of natural resources generally Congressional permission, and perhaps Congressional preference, for carrying out these latter functions through contracts with state and local agencies might be included in the legislation.

Yet the conflicts which plague the present organization would remain for an MVA. These conflicts are so severe as to require political resolution, yet the valley is not a political forum: it has no co-extential government and legislature. The Congress, of course, is the political forum for the area, but it is remote, is pressed by multiple concerns, and is characterized by competing committees. Joseph Kinsey Howard tells how the controversy over commitment of Senator Murray's MVA bill in 1945 was finally compromised by sending it to *three* committees in turn for sixty days each—Agriculture and Forestry, Commerce, and Irrigation.⁵

Therefore, the following proposal is offered. If an MVA is contemplated, a special joint committee of Congress might be created to preside over its establishment and to supervise its operations, subject, of course, to general Congressional approval and to the influence of the President (as well as presidential control through the veto, where legislation is involved.) This committee would be composed of those members of the H. of R. whose districts fall either all or in part within the Missouri Basin as well as Senators from the states concerned.⁶

A committee of this kind would be difficult to establish. It would run counter to the principle of seniority, and it would violate internal control by the Congress over committee assignments. Opposition might be expected from Congressmen who enjoy positions of power in important committees, the jurisdictions of which might be threatened by the creation of the proposed committee. If the majority on the proposed committee were of a different political complexion from the majority in either House of the Congress, a serious problem might be raised.⁷ Finally, if such committee were

⁵ "Golden River," *Harpers*, May, 1945.

⁶ This would make 29 Congressmen and 17 Senators, including in the latter the senior Senator from Iowa, but none from Minnesota.

⁷ Sometimes this problem might be resolved by providing for control within the committee by members of that party which held a majority in the general Congress, but if the joint committee were overwhelmingly dominated by the minority party, this stratagem would defeat the initial purpose of establishing the committee, namely, to provide a political forum for the area. In 1944, for example, the committee would have been heavily Republican in a Democratic administration—12 to 5 Senators, and 23 to 6 Congressmen.

established and flourished, its existence might aggravate the difficulties of national supervision and control of public programs in the region.

Still, there are compelling arguments for creating such a committee. It seems that the Congressional representatives, elected from the area and having to live with its problems, could well be charged collegially with the responsibility for making recommendations to the entire Congress upon such issues as the following. First, the management and use of water with respect to conflicting demands of those interested in flood control, irrigation, navigation, and power, and the allocation of developmental costs among these. Second, priorities among specific developments. Third, decisions as to power development and distribution, e.g., respecting erection of steam plants to firm up the power supply. Fourth, recommendations for action on proposals by MVA as a result of its resource development studies.

Creation of a joint Congressional Committee for the Basin might help constitute a regional political forum. The existing "anonymity", so far as the general public in the area is concerned, of present Congressional committees should be removed. Political issues affecting the entire area might be raised more sharply in campaigns as the electorate came to understand that it was choosing a regional committee. This might lead to more active participation in elections and the assumption of more responsibility on part of the voter. The importance of the general electorate should be enhanced over interest groups. An institutional device which encouraged greater party responsibility might have been provided. An appropriate political forum would have been created for raising issues related to rural-urban conflicts and to inter-sectional grievances.

The proposal has other bearings upon the organization and control of power. With a more responsible administration for the Valley provided—with a clear-cut group of legislators behind whom existed an ascertainable and interested electorate, a vexing problem in the legislative oversight of administration might be mitigated. The new institution should improve the ability of the valley-dwellers to control their own destinies. This might modify the widely-noted drift toward centralization in government. Nor does the proposal necessarily entail a sacrifice of the states, it should be recalled that the joint Congressional committee would be elected

from states, under state election laws, and as candidates of parties organized along state lines; moreover, Congressmen quite typically serve apprenticeships in their state legislatures and are bound to the institutions and destinies of their states in many ways.

*III. Does Partisan Strategy Have a Bearing Upon the
Need for a Political Forum in the Valley?*

The Republicans, solidly in control of the area at present, would expect to dominate the committee; a situation which might constitute an argument for Republican advocacy. The Democrats, stronger, here as elsewhere, in the urban areas, but weak on the committee at present, might still favor its establishment. For the committee would afford the Democrats an opportunity to raise political issues in terms of the entire region and in light of the development of a different pattern of interests. But the Republicans might also welcome the opportunity of evolving counter-proposals in the light of growing urbanization. In short, creation of a political forum for the area would give both parties the opportunity of bidding against each other for electoral support on the basis of a valley-wide program. At the same time, the task of designing programs with wide appeal would call for considerable statesmanship, with which both parties naturally feel they are well-supplied.

PHYSICAL, ECONOMIC, AND SOCIAL FACTORS IN FORMULATION OF LAND USE POLICIES IN RIVER BASINS*

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THERE are certain broad relations of climate to the use and control of water resources that have influenced the development of water policy. In humid parts of the country where precipitation exceeds the needs of agricultural production, control and removal of excess water has always been a problem. In such areas Federal and State programs have emphasized navigation, flood control, and drainage. Water rights have developed under the riparian doctrine which bases the right to water use on the ownership of land contiguous to a stream

In the arid West insufficient precipitation is available for agricultural production. The mountains yield excess water but the supplies from mountain streams are inadequate for all the lands that might be irrigated. Special Federal and State programs have been developed to stimulate the productive use of water for irrigation in the West. Water rights in this area were developed under the doctrine of prior appropriation. This doctrine emphasizes beneficial use and affords protection to enterprises for diverting waters and applying them to lands whether or not they are contiguous to water courses.

The Missouri River Basin represents a transition between these two major climatic zones with their varying backgrounds of water and land use policy. The Basin, therefore, makes a good case study of policy formulation. The lower Missouri Basin States are definitely in the humid section, and the upper or western Missouri Basin States are partly in the semi-arid West. The central or Great Plains portion forms a transition zone with a highly variable climate and an unstable agriculture. An outstanding feature of the development of a water program for the Basin has been the conflict and the necessary compromises between the divergent humid and arid water policies. Proposals for flood control and navigation represented an evolution of the policies from the more humid part of

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the country. Proposals for irrigation developed from experience in the arid West. The conflict between navigation and irrigation was settled in 1944 when Congress gave priority to irrigation for water originating in states wholly or partly west of the 98th meridian.

The central problem in river-basin development is to maximize the beneficial use of the water resource and to minimize its destructive powers at costs commensurate with benefits. The problem has two phases: management of the watershed; and use and control of water in the stream channels. In the Missouri Basin, on-channel water development projects have been first to receive authorization from Congress. The authorization includes over 100 reservoirs, irrigation and power facilities, a levee and navigation system on the main stem from Sioux City to the mouth, and local flood protection works. This plan will provide for the irrigation of 4,700,000 acres of new land, generation of 10 billion kilowatt hours of power annually, and flood protection for 2 million acres of agricultural land, protection for numerous cities and towns, and other improvements. Policy toward Federal investment in watershed management is not so clearly defined as in the policy for investment in structures for river control and water use, although a start has been made in legislation for conservation and flood control.

Maximizing the beneficial use of water where it falls on the watershed for growth of protective vegetation, and for agricultural and forest production and the removal of excess waters without damage to watershed lands are problems in the conservation and management of land. In the Missouri Basin, 80 percent of the land is privately owned and a major portion of the public land is used for agricultural production. Conservation and management of land will be carried out by these thousands of land owners and users to the extent that benefits accrue to their operations or that they are stimulated to action by Federal and State programs. Public benefits from watershed management and protection of on-channel structures are important factors in determining the public investment in conservation of private lands.

The Mountainous areas in the western portion of the Missouri Basin yield an excess of water over the protective and productive needs. Because of its origin in the headwaters of the Basin, this water makes up the major portion of the supply available for irrigation. Most of the high yielding watershed lands are in public ownership. The water yield of these lands is the most valuable pro-

duction and a major objective of watershed management is, therefore, to improve the quality and increase the yield of water.

In the more arid parts of the Basin and under certain local slope and soil conditions, available water is hardly sufficient for a growth of protective vegetation. These areas are often major sources of sediment and they may support little if any productive use. Expenditures for conservation in these areas must be justified largely by downstream benefits.

In the Plains portion of the Basin, additional water is needed for full agricultural production. Moisture conservation practices are of major importance. In the past, development of irrigation has been confined to the western or drier portion of the Plains, except in the Platte Valley where favorable circumstances have encouraged development in the eastern Plains. Present plans would develop a large amount of irrigation in the eastern Plains. In this area, rainfall is sufficient for full production in some years. In other years, however, precipitation is so low or poorly distributed that crop yields are severely reduced. This variable rainfall may be contrasted to the more arid condition where production almost entirely depends upon irrigation. Many economic problems are being encountered in designing irrigation systems to meet these fluctuating needs. Cost of irrigation development in the Plains is proving to be high. It has been partly justified on the basis that it will add stability to the agriculture of the entire area. Studies indicate that existing irrigation projects have added little to the stability of adjacent dryland areas except in cases where dry and irrigated lands are in the same operating unit. Further investigation is needed to discover ways of organizing irrigation so that it will contribute the maximum to stabilizing surrounding areas.

In the eastern, more humid portion of the Missouri Basin, precipitation is usually sufficient for crop production. Generally, there is an excess of water and runoff is high being exceeded only by the mountainous areas. Under the humid conditions in this area the water yield has no value for irrigation. The problem is to make maximum use of water for production where it falls and to dispose of the excess without erosion or flood damage to the land. Conservation and development of the resources of this humid area are important parts of the Missouri Basin program. The area contains about 50 percent of the farm people in the Basin and in 1944 it produced about 45 percent of the farm income. The area is subject

to high flood, erosion, and sediment damages, and is the major contributor to floods in the lower portion of the Missouri River.

For the entire river basin, then, the problem of maximizing benefits involves, first, the use and control of water for watershed protection purposes, for production on the land where it falls, and the delivery to stream channels of excess water in most usable form without damage to land; second, the diversion of water from stream channels for domestic, industrial, and irrigation use; third, the regulation and use of streams for power, navigation, recreation and other purposes; and fourth, protection of bottom lands and improvements from floods.

From a simple reporting on single-purpose projects, Federal cost-benefit feasibility analysis has developed over the years to a rather complex analysis of these multiple purposes. For several reasons, the present procedure falls short of what might be desired to guide Federal investment policy in river basin development. Time and funds do not always permit full exploration of alternative possibilities of development. Major purposes of projects are usually influenced by institutional factors. Development agencies are charged with specific primary objectives, and other objectives may be given only incidental consideration and treated as byproducts of the primary purpose. There is a tendency to average project costs and benefits for the whole river basin which results in the most feasible projects carrying the least feasible and provides no basis for priority of Federal investments. Finally, when several agencies are making project cost-benefits investigations, uniformity in methods used is desirable so that the various analyses might be combined into an appraisal of cost-benefits for all developments in the Basin.

THE ROLE OF THE AGRICULTURAL ECONOMISTS IN THE FORMULATION OF LAND USE POLICIES IN RIVER BASINS*

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I THINK it was Benjamin Harrison who, in a moment of exasperation at a flood control hearing said "Man and water have one great trait in common, they both tend to run down hill." At that time Harrison was serving as the civilian member of the newly created Mississippi River Commission and was busy preparing a "minority report," a task which always has an air of futility about it and which doubtless prompted this singularly cynical remark. Whatever the truth in the remark, it serves as a useful reminder that the concept of the river basin, as used in our discussion today, is political as well as geographic and that it may be the mission of the agricultural economist, working with other men of science and politics, to prevent if possible the too rapid descent of man as well as water.

As it has gradually come to be general knowledge that the complicated relations between man and nature (resources) cannot be safely left to chance, so has it become the business and the duty of the agricultural economist to be available with facts and considered opinions on the complex physio-economic problems communities and governments face in trying to bring about harmonious relations between use and conservation of resources and at the same time maintain the cherished freedoms of individual initiative and decision. In other words, what individuals and governments dealing with fundamental questions of adjustments in land use want to know is how best to go about toward getting the land use changes so evidently needed (some of which are quite drastic) without disturbing in a fundamental way the system of rights, freedoms, and forms which characterize their particular society and form of government. This is not going to be easy. Indeed, the linking of the agricultural economist to problems of man-land relations arising in the river basins of the world is indicative of pending crisis therein. The practical man has stumbled, he must be assisted. He cannot be left to roll down hill.

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What are we agricultural economists to advise in this difficult case of how to bring about desired, and urgently required, land use adjustments in the major river basins? What will we put in the economic brief, now that we have become, like lawyers, writers of briefs?

The economist has in this case, I believe, a dual responsibility. First, in helping in the development and formulation of the land use program, and second in helping to put the program in operation. In practice, of course, the work rarely ever falls into these two distinct phases, as formation and establishment of land policy move more or less simultaneously. There is a two-way reaction between what is planned and what is accomplished. Nevertheless, it is helpful to think separately on these two phases of the economist's role in land use affairs. Let us remark now upon the first phase of the economist's task.

First, we will have to go very slow in recommending that land use matters be handled by legislative decrees, for we know that like the title to land, questions of land use are difficult to establish by legislating. Besides, we are interested in the formation of land use policies *in* the river basins, not *for* the basins. With this in mind, it appears that success in getting individual participation rests upon a favorable relation in the area concerned to the three following aspects of the proposed land use program: (1) The knowledge required to practice the program, (2) ability to practice the program, and (3) willingness to practice the program. Clearly the economist is going to have some knowledge and some pretty definite data on each of these aspects for the basin concerned before any definite recommendations on land use can be made.

I would like to make some observations relative to the various types of land use programs with which economists are asked to deal. In appraising proposed land use policies and programs, the practical economist will endeavor to determine at the outset to what degree the program is designed to bring about a more profitable agriculture on individual farms of the area involved, and therefore charged with strong short-run appeal, and to what degree it is designed to serve the more distant and less personal ends of conservation or of various types of public resource development, wildlife, water-power, recreation, etc. In appraising the long-run programs in terms of the response they will receive locally and in terms of the prospects for their ultimate accomplishment, it may

be well to recall the remark attributed to Lord Keynes. "That in the long run we are all dead." This may sound harsh, selfish, and short-sighted, but I wish particularly to point out here that it is the duty of the agricultural economist in his appraisal of land use programs and policies to protect the individual and the community from those programs that appear to be unduly weighted toward the long run or produce benefits so remote from the individual that there can be no clear motive for active individual economic participation. There is no intention here to minimize the importance of certain long-run benefits, but only to say that unless the land use program has some short-run benefits, the long-run aspects are not likely to be realized.

It might be well to mention here that land use programs and land use policies and ideas in the outline stage are almost a dime a dozen. Every chamber of commerce, every state board of development, every religious order, to say nothing of the many governmental agencies, has one or more outlines of land use plans. These programs range all the way from weird schemes for state and local soil-mineralization services to proposals for wilderness areas. Frequently enough some of the least promising ideas are backed by organizations with considerable money and skilled publicity departments. In the alluvial valley of the lower Mississippi River alone, there are more than 60 organized groups with one or more programs or ideas relating to the utilization of land resources. It would not surprise me that one of the big jobs of the agricultural economist of the near future will be that of protecting agricultural areas from adoption of faulty schemes of promoted land use adjustment. Whether irrigation work can be justified on the basis that they will *stabilize* the agriculture of an area is a question which economists may be asked to work on.

At any rate, the first step in appraising land use policies and programs is to find out where the alleged benefits are to fall. Once this is known, and it is not an easy thing to know in many cases, there is some basis for beginning an assesment of the costs. It is thus in the role of bookkeeper between public and private benefits and public and private payments toward cost that the agricultural economist will render part of his service. In cases where benefits are largely public in character, decisions on the program lie largely in the field of political economy, which we shall not enter in this brief discussion. Where individual benefits, as well as public, are

definitely present, and it is hoped that most of our agricultural programs will be of this nature, the task of the economist relates to the three above-mentioned points (knowledge, ability, willingness) which are determining factors in the success with which individuals can participate.

The popular, and sometimes the professional, discussions of land problems as they may be attacked under the direction of various types of regional authorities, have often been charged with a certain magic that one is asked to accept as a natural product of basin-wide or regional cooperation. I won't dwell on this point except to say that I, for one, have not been able to discover all the energies and benefits that are supposed to follow from the creation of regional bodies or from other types of basin-wide planning. The available economic literature, and it is pitifully little, relating to the TVA fails to give any satisfactory picture of the economies of this vast undertaking and whether the benefits, and there have been many, from the operation of this Authority are unique, and if so, in what way and at what cost.¹ I am thinking here of the agricultural program.

Though the economist will have an important role in helping form the general outlines of land use policy and in the establishment of over-all administrative machinery for the bringing about of desired resource uses, some of the most valuable work of the agricultural economic staff will be in the development of strategies applicable to the numerous local areas where the proposed program goes into operation. At this stage of the plan there must be more than general knowledge. There must be specific knowledge of the economic and social characters of the types of land use actually practiced and those proposed. There must be clear knowledge of the cost (social and economic) of transition operations.

When the State is to bear part of the cost of transition, as in land clearing and land drainage programs, it is essential to the development of a sound program of aid to have exact knowledge of the steps in the transition process and the cost of each. We know that government payments for land drainage and land clearing could have been made much more effective, as a means of aiding farmers in desirable land use adjustments, if agricultural econom-

¹ The fact that economic studies of the TVA have not been developed sufficiently to show the benefits to be derived from the authority should not lead to the conclusion that benefits are not present.

ists had been able to provide some practical ideas of the amounts required by areas to make constructive headway in these aspects of redesigning the farm business. The idea of a uniform payment is certainly sinking to sea level as far as the economist's function is concerned.

In getting the knowledge, the ability, and the willingness synchronized, the agricultural economist will be called on to solve some very different problems. Often he will have to fall back on his native wits. I fear that there are no textbooks to guide him. He will soon find that the much talked about combination of enterprises yielding maximum profit is likely not to be a combination at all but rather a planting of the largest possible acreage of that single crop yielding the highest net returns per acre. Some of my farmer friends have just lately been putting their agricultural operations through the process of undiversification after foolishly listening several years ago to certain conservation lectures. Conservation must pay, and in these days it must pay in cash, not in the intangible (but none the less valuable) rewards certain older societies have sometimes been able to establish.

There is really not time to explore the details of the economist's role in the formation and establishment of land use policies in the river basins. It is literally a detailed task. There are no short cuts, no easy, simple ways to explain what he must do. Knowledge of regional, area, and individual farm problems are required.

It is certain that some very interesting social and economic situations will be faced in attempting to bring about desirable land uses and at the same time maintain a semblance of order and harmony in other aspects of rural life. For example, in the last session of the Mississippi Legislature a bill was introduced which proposed that certain lands in the Delta, or lowlands, be assessed special taxes to be paid to certain hill counties where flood control reservoirs to protect the Delta were being built, causing great reduction in the taxable property.

The economist will have to help keep the peace.

ROUNDTABLE ON COTTON MARKETING

Chairman: Lippert S. Ellis, University of Arkansas

COTTON MECHANIZATION. ITS PROBABLE INFLUENCE ON MARKETING*

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THE impacts of cotton mechanization, particularly the mechanization of harvesting, will be important from the standpoint of marketing. Appraisal of these impacts lends itself to the following considerations: (1) modifications in the operation of marketing agencies, (2) changes in the performance of marketing functions, and (3) broad aspects of mechanization.

Modifications in the Operation of Marketing Agencies

The operations of marketing agencies are affected by the trend toward cotton mechanization. The points covered in this discussion include: (1) cotton gins, (2) cooperatives, and (3) location of agencies.¹

Cotton gins. Mechanized harvesting is shifting a large share of the responsibility for maintenance of cotton quality from the grower to the gin operator. In response to such factors as good roads and increased truck transportation, and coupled with the influence of machine harvesting, the trend is away from the \$5,000 or \$10,000 gins. In their place is the modern plant complete with up-to-date cleaning and drying equipment and with a capital investment ranging from \$40,000 to \$80,000. It is reported, for instance, that \$1,500,000 is being spent in North Carolina to modernize gins for the 1948 season. Such gins call for higher calibre management. A \$150 a month man may well keep a small gin going but such cheap management could prove expensive if entrusted with the operation of a \$60,000 establishment.

Gin operators in many parts of the Southeast have given little attention to ginning costs or to improved methods of operation. Ginning often has been looked upon largely as a means of procuring

* A paper given at the Annual Meeting of the American Farm Economic Association, Green Lake, Wisconsin, September 15, 1948.

¹ It also is recognized that handling operations in modern warehouses have become mechanized in recent years.

cottonseed at very favorable prices. Another factor that has limited the efficiency of gin operation and the effectiveness of serving farmers is the practice engaged in by many gin operators whereby they derive a large share of their income from buying and selling cotton on a speculative basis. There is reason to believe, however, that modern gins will compete largely on the basis of cost and service to patrons.

Important from the standpoint of ginning is the influence of mechanical harvesting on quality. General experience indicates that when machine harvesting is first tried, quality often is two and sometimes three grades lower than hand picked cotton. With the installation of better ginning machinery and with greater care in harvesting, this differential usually has been cut to one or, at the most, two grades. Adequate grade comparisons for machine harvested and hand picked cotton were not available for North Carolina in 1947. Preliminary findings, however, indicate a difference of approximately 6 cents per pound in the loan rate for machine stripped as compared with hand picked cotton.² It is to be expected that an increase in mechanical harvesting will result in higher ginning costs. Another consideration relates to the fact that unless the quality of mechanically ginned cotton is improved, premiums for hand picked cotton may become larger.

Cooperatives. There is little indication that the mechanization of harvesting has had much influence on the operation of cotton marketing cooperatives. There are possibilities, however, for increased service to patrons that aggressive associations might consider. One possibility is the establishment of modern, large-scale gins, designed to handle machine harvested cotton. Many cooperative gins, especially in the West, have pioneered in the installation of modern equipment and in the improvement of services for members. To furnish the leadership needed to run modern gins and related marketing activities, cooperatives might band together for such purposes as employing high calibre management, operating oil mills, and establishing central accounting systems.

With increased emphasis on farm machinery and other farm supplies, a reasonable increase could be expected in the cooperative farm supply business in cotton areas as farmers increase their capi-

² Preliminary findings of a study of cotton mechanization in North Carolina conducted by Mr. Gwyn Sutherland, Agricultural Economist, USDA.

tal resources Such development might take place through separate supply associations or through integration of operating activities on the part of cotton marketing cooperatives.

Another possibility for cooperative associations is that of establishing a harvesting service for their patrons, particularly for those patrons having small holdings and not able to purchase and operate their own machines. It should be emphasized that while such developments are likely, whether they will be undertaken on a cooperative or on a private basis will depend largely on imagination and ability of cooperative management to render a pace-setting service for members. Some of these developments also might come about as a result of civic action. In 1946, for instance, county commissioners in one North Carolina county tried to buy three cotton pickers to alleviate the shortage of picking labor.

In any event, cooperative associations can make important contributions by conducting aggressive educational programs designed to acquaint members with the implications of mechanized harvesting as it relates to marketing and production practices.

Location of marketing agencies It generally is agreed that mechanization of cotton harvesting will reduce costs of production. In the long run, it can be expected that most of the resulting reduction will be passed on to mills and eventually to consumers. This will mean a relatively lower farm price for cotton. In its wake will be a shift from the small, inefficient, non-mechanized farms to large units lending themselves to complete mechanization. This shift will cause changes in production within areas and between states. In some places there will be excess capacity in gins and warehouses and in some cotton buying agencies may have to restrict, discontinue, or shift the location of their business operations. In areas experiencing an increase in cotton production just the opposite events may be expected.

Changes in Marketing Functions

Marketing functions will be influenced in numerous ways by the mechanization of cotton harvesting. Under normal conditions of weather, the picking season can be expected to be shorter. As a result, cotton will move from the farm in less time. Furthermore, the cotton farmer usually sells his crop (cotton and cottonseed) at the time of ginning. To the extent that mechanization contributes to a shorter harvesting period, problems of transportation will be

intensified, burdens on warehousing will be increased, and additional demands on financial institutions will be made ³

Other marketing functions that are likely to be influenced by mechanized harvesting are selling practices and buying operations.

Selling practices Most cotton commonly is sold by farmers on the notorious "hog-round" basis

Failure of farmers to sell on the basis of price differentials that reflect quality has long been one of the curses of the trade. With mechanical picking, however, there is a possibility that buyers will be more inclined to purchase from farmers on a grade basis. Because of the differentials that are likely to prevail for grades, mechanical picking may serve as an entering wedge in the establishment of a pricing system that goes further in reflecting the quality produced. Such a development in itself might go a long way in counter-balancing the lower returns resulting from reductions in quality attributed to mechanical harvesting.

Mill buying operations. A considerable proportion of the cotton produced in North Carolina and in the Southeast is sold direct to mill buyers. Some of the gins from which mechanically picked cotton is available report that these buyers at times have followed the practice of discounting the price of this cotton one or two cents a pound. Since this cotton already has been graded and as such reflects quality, this practice has no economic justification.

Broad Aspects of Mechanization

On the basis of the preceding discussion, the two following observations are made:

1. Mechanized harvesting of cotton, with its possibilities of reducing production costs, has important implications from the standpoint of marketing agencies and cotton producers. It offers an opportunity for halting the trend toward pricing ourselves out of foreign markets. It also should reduce price competition on domestic markets from such items as rayon, nylon, and fibre glass.

2. Machine harvesting eventually will make possible the complete mechanization of production practices in a large part of the

³ Quality also may be influenced because of the time of harvesting. Machine harvesting usually starts two to four weeks after hand picking commences. Nevertheless, machine harvesting usually is completed before hand picking. Obviously quality is influenced by weather prevailing at different parts of the harvesting season and by the time required to complete harvesting.

cotton belt Until this key operation was mechanized, there was little incentive for farmers to get away from the one- and two-mule economy of the cotton belt since the mechanization of cultivation, spraying or dusting, chopping, and fertilizing operations would only contribute to further unemployment of people needed for picking. Larger farms and shifts within and between producing areas can be expected. This will require greater ability on the part of farm managers and operators.⁴ The person who trudges behind a mule up and down the cotton row may be ill suited to operate a \$7,500 cotton picker. Additional premiums will go to those who add capital wisely, who are willing to study the performance of various kinds of marketing agencies, and who have ability to interpret and use economic facts as they relate to the establishment of sound sales policies.

3. Mechanized harvesting of cotton will influence the operation of ginning agencies. These operations will be conducted in large-scale, modern establishments which will require competent management. Cooperative associations have the opportunity of integrating supply service and marketing operations and of expanding their services for farmers. The location and extent of business for all types of marketing agencies serving cotton producers will be influenced by shifts within and between production areas.

4. Concentration of harvesting during shorter periods will call for greater skills in the performance of such marketing functions as transporting, warehousing, and financing.

5. Indications are that greater emphasis will be given to the development of a pricing system which adequately reflects variations in quality and which will have broad application in the selling methods of producers and in the buying practices of dealers, cotton merchants, and mill operators.

⁴ The ability of management also has a bearing on the quantity of cotton left in the field after mechanical harvesting. This is important in determining the efficiency of machine picking. While our experience in North Carolina is limited and while our findings are preliminary, a summary of four tests of mechanical stripping shows that 7.9 percent of the cotton was left in the field. The average ranged from 6.5 percent to 11.3 percent. Loss from mechanical picking was somewhat higher, averaging 1.4 percent and ranging from 11.8 percent to 16 percent. When test lots were immediately rerun, losses were cut to 4.4 percent, ranging from 2.6 percent to 5.3 percent. (Op. cit. 1)

RESEARCH IN COTTON MARKETING*

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IN TERMS of research accomplished in cotton marketing, the studies of price-quality relations in the local cotton market stand out in bold relief. The southern agricultural experiment stations have been severely criticized for the apparent duplications involved as these studies were made in all the principal cotton states. But the maladjustments in the local markets were of such serious proportions as to justify much of this repetition.

Anyone familiar with the cotton problem is aware of the fact that interest in marketing on the part of growers has been spasmodic, emerging only during periods of low starvation prices. The emphasis then has been primarily on ways and means of raising the price whether by holding the product off the market, or by "feeding" the market, or by out-and-out price fixing, or by parity price standards. Very little interest has been manifested in the cost and efficiency of the cotton marketing system. But at times growers have expressed dissatisfaction with the relatively small share they receive of the consumers' cotton dollar.

In view of the sudden major emphasis on marketing in the activities of State and Federal research agencies, market researchers face a trying situation. It should be patent to everyone that the Congress, the general public and agricultural producers are all expecting quick tangible results to flow from all marketing studies undertaken. Unhappily, expectations and accomplishments for the years immediately ahead may, in some instances, be rather widely separated.

Cotton Marketing

Research workers in cotton marketing are fully aware of their responsibilities. How best to make good on the assignments which must be accepted is the burning question of the hour. It should be evident that a program contemplating a simultaneous attack on the whole marketing front from cotton grower to ultimate consumer would be indiscriminate and could lead to much fruitless and misdirected effort. To be sure, research must be approached from the standpoint of the problems involved in cotton marketing.

* A paper given at the Annual Meeting of the American Farm Economic Association, Green Lake, Wisconsin, September 15, 1948.

A listing of such problems is but a beginning. In the main, at least two tests need to be applied in selecting the fields to be investigated: (1) the problems must be significant and (2) the problems must be such that the results of investigation may be put to practical use without too much resistance.

Among the various aspects of cotton marketing particularly well suited for study, three may be singled out (1) the price-quality relations in local cotton markets; (2) quality characteristics of the lint best suited to the various uses of cotton; and (3) ginning problems which may arise from a more general adoption of mechanical harvesting of cotton.

Price-Quality Relations in Local Markets

Significant changes have occurred since the price-quality study was made. Classing service is now very generally available to growers which was not the case 15 to 20 years ago. This means that growers can now readily ascertain the quality of their cotton according to U. S. Standards. In recent years, great strides have been made in the promotion of one-variety communities. As a consequence greater uniformity of quality in the gin community has been attained. The question can then very properly be raised as to whether or not growers of one-variety cotton with Smith-Doxey classing service are obtaining prices for their cotton commensurate with quality. Significantly the promotion of one-variety cotton in at least one of the states is based solely on the higher yields of lint per acre of the chosen variety. Nothing is said whatsoever about the possibilities of premiums to growers as a result of the more desirable characteristics of the selected variety. This would seem to be an off-hand admission that growers of one-variety cotton are not generally receiving the market premiums for superior quality.

Then again, ideas of quality have changed greatly. Earlier, quality was defined in terms of grade and staple length with a troublesome left-over parading under the designation of "character." Even-running lots were thought of as being governed by lint of like grade and staple length. This is now less and less the case. Much progress has been made in ascertaining numerous quality characteristics of significance to spinners and considerable headway has been made in developing instruments for measuring them. Chief among these quality attributes are: uniformity of fiber, tensile strength, fineness; and maturity. Strangely enough growers no sooner obtained classing service than it became appar-

ent that other quality characteristics than grade and staple length must also be ascertained. Thus the Smith-Doxey classing service only partly fulfills present requirements in the task of quality determination. Obviously proper price-quality relations in the farmers' cotton market now involve more than full premiums, or discounts, for grade and staple length.

A significant problem for research in the local cotton market is that of determining the sensitivity of farm prices to quality characteristics in their broader scope. A second important problem is that of ascertaining to what degree the quality characteristics of importance to the spinner may be made the basis of trading in the local market, this involves the nature of the reorganization needed in the local market to facilitate suitable trading practices. It should be patent that growers will continue to be indifferent to the quality of the cotton they produce so long as local cotton prices fail to reflect premiums and discounts in terms of the quality of the cotton offered for sale in the local market.

Quality Requirements of Mills

Cotton is put to almost innumerable uses. Desirable quality characteristics suitable to these different uses vary widely. Cotton as a raw material in demand by manufacturers is not a matter of a few simple attributes but rather a complexity of attributes. Thus no one type or variety of cotton is best fitted to all uses. By and large cotton growers are quite unaware of the wide range in quality characteristics in demand. Mill requirements from the standpoint of cotton growers are a virgin field for study. This aspect of the cotton problem needs careful probing before an intelligent variety program can be worked out for growers in all sections of the cotton belt.

Quality tests other than grade and staple length have been developed and are being applied principally in the laboratory. What is now needed is to determine to what degree the laboratory tests stand up under actual mill operating conditions. That is, to what extent can the laboratory methods of quality determination be accepted by the mill operator.

Mechanical Harvesting as Related to Ginning

The relation of ginning capacity to output of cotton takes on a new aspect with an increasing adoption of mechanical harvesting. For the past forty years ginning capacity in Texas has been adjust-

ing itself to cotton output in such a manner that the total crop could have been ginned in 26 days of full 12-hour run per day. During the period 1930-1942, cost analyses in Texas indicate such a relation between capacity and output of cotton that, on the average, ginners break even on their operations. That is, income and costs are equal. The low volume of Texas gins means high fixed costs. Even a relatively slight increase in volume above that of the break even would significantly reduce costs per bale. The shortness of the ginning session and the insistence of growers on prompt service are primarily responsible for the relative over-capacity.

An increase in the number of days of full run ginning rather than a lengthening of the ginning period could materially reduce the gin capacity needed. Such objective could be attained through the addition of a seed cotton house to ginning equipment. During days of harvesting beyond ginning capacity, the surplus seed cotton could be stored in the cotton house; during days of light receipts, the current run could be supplemented by ginnings out of storage stocks of seed cotton, and during days when weather conditions do not permit harvesting, the gin could operate on stocks in storage. Thus the gin with a sizable cotton house would be in position to increase significantly its volume of ginning without in any way jeopardizing its service to patrons. As a consequence the number of gins could be reduced or the size of gins could be reduced. Either adjustment should be a factor in reducing ginning costs.

As an increasing number of growers turn to mechanical harvesting, a considerable strain on ginning capacity over short periods is bound to occur. In view of normal ginning capacity, the rate of ginning can be stepped up considerably with present capacity. To the extent, however, that the demand for ginning service may not be fully met over short periods, two alternatives present themselves. (1) ginning capacity could be increased or (2) seed cotton houses could be provided for storing receipts above daily capacity. Increasing ginning capacity would mean higher ginning costs to growers. Perhaps the most feasible adjustment would be attained through the adding of cotton houses.

The ascertaining of the advantages and disadvantages of the seed cotton house requires considerable research. The grower himself might furnish the storage facilities. This might involve a testing of various types of facilities from temporary structures to permanent warehouses. Even trailers with detachable running gears

might merit consideration. The matter of handling the seed cotton, cleaning equipment, preservation of quality, and costs would all be involved. In the study of farm storage the starting point would be that of acquiring as complete information as possible from growers with farm storage experience. One feature of this study, no doubt, would be the designing of farm storage facilities.

The operation of the seed cotton house at the gin is an untouched field from the standpoint of research. As a first step, the experiences that ginners have had with seed cotton houses would need to be ascertained. One of the most significant aspects of the study would be that of determining relative costs of a sizable cotton house with cleaning and drying equipment and of a second complete gin plant. The attitude of growers towards the use of the cotton house is most important. How insistent is the grower on waiting in line for delayed ginning rather than accepting prompt unloading into the cotton house? How would the growers react to a drop in prices of lint and cottonseed from the time of putting the seed cotton in the house and later ginning? Would it be necessary to provide hedging service as protection against possible price declines?

It would seem that the three fields proposed above would qualify from the standpoint of the significance of the problems to be studied and of the feasibility of practical application of the findings.

ROUNDTABLE ON FORMULA PRICING OF CLASS I MILK UNDER MARKET ORDERS

Chairman. T. M. Adams, University of Vermont

FORMULA PRICING OF CLASS I MILK UNDER MARKET ORDERS*

WM. C. WELDEN

H. P. Hood & Sons, Inc.

EFFORTS to stabilize our agricultural economy in recent years have involved a substantial amount of commodity price-fixing by governmental agencies. Success in the eyes of the public has been relatively elusive in this job. This has sharpened the interests of economists in the subject of administered prices and has made each new line of effort a topic of lively discussion.

Class I or fluid milk has been one of the main fields of price-fixing activity. It provides for several reasons one of the most interesting to discuss and study. Half or more of the States and the Federal Government have been fixing minimum Class I milk prices in selected markets for the last 15 years. Today probably 75 percent of the fluid milk sold in the metropolitan population areas of the nation is sold at minimum Class I prices established by a State or Federal order. Public interest has been intense because of the importance of milk in the diet and in the budget. Farmers and milk dealers have been especially interested because the minimum prices fixed have usually been the prevailing prices paid. Milk price-making forces are fairly complex because while sanitary rules, perishability, and bulkiness tend to localize each major city as a market, the interchangeability of milk is great enough to require a fairly stable relationship among markets and among the various dairy products. Pricing procedures and pricing mechanisms under these milk marketing orders have varied considerably from time to time and from market to market, even among the 30 or so Federal market orders issued pursuant to the Agricultural Marketing Agreement Act of 1937.

These facts explain the interest shown in the new pricing plan adopted on April 1, 1948, for the Boston market.¹ This plan was

* A paper given at the Annual Meeting of the American Farm Economic Association, Green Lake, Wisconsin, September 14, 1948.

¹ Federal Milk Order No. 4 for the Greater Boston Marketing Area, Amendment No. 6 issued March 25, 1948.

also adopted for the adjacent Federal order markets of Fall River and Lowell-Lawrence. The main features of this Boston formula were developed during the summer of 1947 by a committee appointed by the Administrator of the Boston Order. The committee included 3 professors in Agricultural Economics from New England colleges, 2 economists from local farmers' cooperative associations, 2 economists from local milk distributors, and one economist from the Administrator's office. The Committee Report² formed the basis for amendments made to the Federal orders to incorporate the new pricing program.

Recent pricing and marketing conditions in Boston provided very favorable conditions for the consideration and acceptance of a new pricing program. War-time prices affected the seasonality of market receipts and served to move supply and demand in opposite directions more frequently than otherwise. A price formula relating Class I prices to market quotations for butter and skim milk powder adopted soon after the war proved to be very unstable. It had to be altered by suspensions with little advance notice in order to prevent serious anomalies, and did little to help correct basic supply conditions. The longer run history of Class I milk prices in Boston provided several periods when receipts and sales trends made it rather obvious that mistakes in prices had been made, and thus provided a good basis for comparison with the prices which would have prevailed under the new formula.

The first job of the Committee was to develop a set of objectives to serve as broad standards for its work. These are indicated generally in the Agricultural Marketing Agreement Act of 1937 under which the orders are issued. These objectives were:

- 1 An adequate supply of milk at all seasons, defined to include a reserve of 20 percent above actual sales in the months of shortest supply
- 2 A more reasonable pattern of seasonality in market receipts than recent years
3. Orderly and timely price changes in line with changing supply and demand conditions.
4. Prices and incomes for dairymen in line with general economic conditions.

In order to accomplish these objectives it seemed clear that the Class I price should be made to change automatically as soon as

² A Recommended Basis of Pricing Class I Milk in the Boston Market, September 1947, Market Administrator, 80 Federal Street, Boston 10, Mass.

specified conditions changed, rather than be established at some fixed level which level could be changed only after a public hearing and an approval vote from producers. Although public hearings appear to have some special appeal as legal instruments, and fixed prices seem more simple, more direct, and represent a firmer guarantee to farmers, these advantages are questionable today. Public hearings have become slow and cumbersome, often promote intemperate, emotional, and destructive discussions, and in the case of milk prices, mean that each price change, whether up or down, must involve a new producer vote of approval. Also, when economic conditions are changing rapidly, each fixed price must be based on conditions already well past or on an uncertain forecast of the future. In other words, the objective of orderly and timely price changes is very difficult to achieve.

It should be possible to make automatic or formula prices for Class I milk as logical and as understandable to dairy farmers as fixed or pegged prices. Sound formula prices provide an infinitely greater guarantee of security to farmers and of fair and reasonable prices to the public than prices fixed at any specific level for an advance period. It is most important to recognize also that if an obvious defect develops in the formula or if it needs to be amended temporarily to meet a special local situation, then a formula can be amended after a public hearing just as quickly and just as easily as a price level can be changed in a fixed-price type of order. The formula, therefore, is in no respect more fixed or rigid than a pegged price, but does guarantee timely price changes in the interim between public hearings.

Briefly the new Boston formula provides that the Class I milk price shall vary in accordance with changes in a composite formula index calculated on a 1925-29 base. This index is the simple average of (a) the latest monthly index of all wholesale commodity prices in the United States as published by the Bureau of Labor Statistics, (b) the average of the last three monthly indices of Department Store Sales in New England as published by the Federal Reserve Bank, and (c) a joint index of the latest available costs for farm labor and for dairy feeds in New England as calculated by the Market Administrator each month from regularly published figures. The basic Class I price varies in intervals of 22 cents per 100 pounds in accordance with bracketed changes in this composite formula index.

Super-imposed on this basic price structure is a seasonal pattern which provides a price 44 cents per 100 pounds above the basic level in the 4th calendar quarter, and 44 cents below the basic level in the 2nd calendar quarter each year. An additional seasonal safeguard prevents any price increase from March through June and any price drop from September through December each year.

Also super-imposed on the basic price is a provision whereby the Class I price is automatically lower by 44 cents as soon as and so long as the percentage of surplus in the market for the most recent 12 months is above the critical level defined as 41 percent. Similarly the critical level on the low side is 33 percent, which calls for a price 44 cents higher than otherwise provided so long as the shortage continues. Only such part of this supply-demand adjustment can operate as will not cause a price change from the same month a year earlier of more than 88 cents per 100 pounds.

The three basic factors in the formula are designed to reflect local supply, local demand, and general economic conditions. The three are given equal weight for reasons of simplicity and logic, and also because the results met the empirical test. So far this has had very popular appeal. With a relatively inelastic demand and with delayed if not inelastic supply responses, this equal weighting might not have been necessary to meet some of the objectives, but it is fair and reasonable and is safeguarded by the supply-demand adjustment. Also, the weightings might not have been equal if the results of detailed statistical and correlation analysis of factors affecting the Class I price had been adopted. The objectives called, however, for a more general empirical analysis with logic and equity and sound public policy as the standards.

The wholesale price level represents a basic tie-in with the whole economy of the nation, measuring the level of general economic conditions as reflected on a composite basis in the primary wholesale markets. In any analysis of factors affecting Class I prices, the first step would probably be to deflate the price series by this wholesale price level, just as for resale price analysis the series might first be deflated by the consumer price index.

Grain and labor costs reflect the main cash cost items in milk production in New England. Changes in such costs may not forecast precisely changes in the supply on a short-run basis, but a stable relationship between these costs and milk prices is necessary to a stable milk supply. Changes in these costs, also, must be important

factors in the timing and degree of milk price changes if such milk prices are to bring economic stability to the farmer. Total production costs are more difficult to measure. Also, they are partly reflected by the wholesale price index.

The demand factor used in this new pricing formula has probably created more comment than any other factor. The index of New England Department Store Sales was selected as a measure of changes in New England consumer purchasing power. It comes closer to measuring changes in the disposable income than any other factor available—payrolls, industrial activity, or others. It is available monthly, whereas actual income figures regionally are available only on an annual basis and are not available on an annual basis until August of the following year.

There is available, of course, a current monthly figure on the amount spent for milk. To use such a figure as the demand factor, however, would be to flaunt public interest and potentially at least exploit the inelastic demand for milk. It would be comparable to using the farm value of all the milk produced as an index of the supply part of a pricing arrangement. It would be circular reasoning of the worst type. If the supply were inelastic this value would change only after a price change rather than before. The same would be true of the money spent for milk if demand were inelastic.

This index of consumer purchasing power does not necessarily measure or forecast in any precise or accurate manner changes in the sales of milk at various prices. This need not be its restricted purpose, however, in the pricing formula. It is the key factor on the demand side, fundamentally affecting the price consumers will pay for milk and the amount they will purchase, and thus the basic factor in the reasonableness of milk prices from a public interest standpoint. The formula recognizes that changes in income-price relationships will affect sales, just as changes in cost-price ratios will affect production, and that sound orderly prices require a balanced relationship to both incomes and costs. This balancing job may change in character if there is a basic change in milk using habits or in the techniques of milk production. Any formula may need basic changes accordingly.

The special seasonal pricing provisions are designed to encourage a return to the more normal pre-war seasonal pattern of milk production. Short-season market receipts in Boston in recent years have been only about half of flush season receipts, as compared with

60 to 65 percent before the war. Emergency imports from as far west as Minnesota have been necessary in four of the last five short seasons in order to meet sales needs, and in two of these four years milk sales actually had to be restricted because the milk could not be obtained. Last year's imports were close to 20 million pounds. Yet in June this year Class I sales were less than 50 percent of market receipts

The special supply-demand adjustment is a basic safeguard and an integral part of the entire program. The critical limits of 41 and 33 percent surplus on an annual basis are designed to correspond to 25 and 15 percent necessary operating reserve in the short production months. The mid-point of 37 percent annually would normally provide a 20 percent operating reserve to cover day to day fluctuations and thus insure an adequate supply in the shortest month of production

On an empirical test, the new formula would have given slightly higher prices than actually prevailed in 1924 and 1925. Formula prices would have been lower in 1929 and 1930, but would not have fallen as sharply or to as low a point in 1931, 1932, and 1933. Formula prices would have been lower again in 1938, 1939, and 1940. The war years do not furnish a good comparison base because the wholesale price index was so much affected by OPA ceilings. The formula would have given a lower price in 1946 but a higher price in 1947. In retrospect it seems clear that the formula would have prevented some of the more obvious price maladjustments of the past in Boston

The principal novel features of the Boston milk price formula are (1) the use of a demand index as one of the basic parts of the formula, (2) the provision for automatic price adjustments when receipts and sales get out of balance, and (3) the omission of market price quotations for any manufactured dairy product as a basic part of the formula. These innovations have been variously praised and criticized. Time and experience, of course, can supply the only reliable judgment as to the soundness of these new features of the Boston formula both as a matter of principle and in respect to the details

It should be stated that the price committee, the dairy industry in New England, and the Department of Agriculture are open-minded on the entire formula and these innovations. There is a strong feeling that the new pricing plan is sufficiently sound to

warrant a real trial before it is changed in any basic sense. This seems to be necessary in order to build confidence among producers and consumers, and more important, is necessary in order to provide a real test of the adequacy of the formula.

Some modifications in the Boston formula may be needed in order to establish the appropriate relationship with milk prices in nearby markets. In order to accomplish this it may be desirable to try to develop a different or broader measure of demand. It might be possible, for example, to have the Department of Commerce develop a direct measure of regional income on a monthly or quarterly basis. Again, it might be feasible to develop and use a Department Store Sales index for the entire Northeast rather than for each Federal Reserve District. It should be recognized also on this inter-market problem, that when supplies are more normal, it may be more desirable to recognize local supply and demand conditions promptly than to follow a rigid price relationship with adjacent markets.

A composite of manufacturing milk prices might be used as an additional factor in the index or a partial substitute for the wholesale price index. Before the war the wholesale prices for some of the principal manufactured dairy products such as butter seemed to furnish a good broad index of changes in supply-demand conditions for all dairy products and in general economic conditions. This basic relationship is much less evident since the war. Some of the prices have been erratic, and there is evidence of changes in the character of the demand for some of these products. There seems to be, temporarily at least, much less reason for using butter, for example, as a basic guide to fluid milk prices than might have been true before 1940.

The supply-demand adjustment is most novel, of course, and is designed as insurance against shortages or over-production, as well as a means of helping to correct any deficiencies which the formula may contain. Here again the detailed application of the supply-demand adjustment must be looked upon as experimental. Both the amount and the timing of the price adjustments based on the amount of surplus in the market will need to be studied very carefully. This part of the formula could not be given too rigid an empirical test because obviously if prices had been different in past years, market receipts and sales might also have been different.

To the industry in New England one of the most encouraging

aspects of the new pricing program has been the approval it has received from producers and producers' cooperatives, from milk dealers, and from the newspapers in southern New England markets. Perhaps equally encouraging is the fact that the prices which the formula has created have already stimulated milk production without seriously affecting sales. The producer reaction may be different, of course, when the formula begins to create price reductions, but there is reason to believe that most farm groups in the area understand and appreciate the fairness of the formula. There is reason to hope, therefore, that it may be the most orderly means of bringing about downward price adjustments when they are needed.

FORMULA PRICING CLASS I MILK UNDER MARKET ORDERS

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FORMULAS have been used for several years in pricing Class I milk under market orders. Despite their widespread use, modification of formula procedure in markets using them has been necessary from time to time. Their continued use indicates that formulas are of value in pricing milk, but their frequent change indicates that amendment procedures including public hearings also are necessary.

It appears to be impossible to devise a formula which will function satisfactorily without change over the years. There are several reasons for this. First, there are many factors that affect the price of Class I milk, more factors than can be included in any formula. Second, there is uncertainty as to the weights that should be assigned to the various factors, and as to the extent of lag that should be allowed for in each case. Third, the weights and the lags which are appropriate at one time may be inadequate at a later date. Fourth, the acceptability of Class I prices to producers, distributors, and consumers is influenced by non-economic factors which change from time to time.

Recognition of these facts is important so that although public acceptability will result from the presentation of the basis of a formula when one is used, yet the imperfect nature of the formula will be generally known and undue resistance will not be offered to changes in the formula which will be needed.

Recent study of the use of formulas in pricing Class I milk has emphasized their construction for use within particular markets. Perhaps equally important is the degree to which various formulas are adaptable to use in competing markets in a manner which promotes logical and reasonable inter-market price relationships.

Year-to-year changes in price differentials between markets are much smaller in amount than are year-to-year changes in the Class I price in given markets. During 24 of the 27 years in the period 1922-1948, reported Class I prices in the Boston market fell within

* A paper given at the Annual Meeting of the American Farm Economic Association, Green Lake, Wisconsin, September 14, 1948

a range of 11 cents above and 22 cents below the Class I price in the New York market. In contrast to these relatively narrow changes in inter-market differentials, Class I prices in both the Boston and New York markets varied widely over the years. In the New York market, for example, the Class I price rose 80 cents per cwt. between 1924 and 1929, declined 162 cents between 1929 and 1932, rose 83 cents between 1932 and 1936, declined 39 cents between 1936 and 1938, and rose 330 cents between 1938 and the first nine months of 1948.

Changes in inter-market differentials have tended to become even less than usual during recent years. In the nine full years during which federal orders have been effective in both the Boston and New York markets, 1940-1948, the basic Boston price for Class I milk testing 3.7 percent has varied within the narrow range of 20 cents from the New York price for milk of similar test in the 200-mile zone. The differential remained at a fixed amount, with a Boston price 9 cents below New York, in the 32-month period from November 1943 through June 1946. It also remained at a fixed amount, with the Boston price 11 cents above New York, in the 17-month period from November 1946 through March 1948. The Boston price has averaged 11 cents above New York in the immediately succeeding months from April 1948 to date.

During these recent years when inter-market differentials have tended to change less than usual, their exact amounts have become more important. Fluid milk consumption has increased relative to production. Serious milk shortages in the late fall and early winter months have become common, especially in the Northeast. Acute competition for supplies has developed among markets with adjacent milksheds, with price premiums and other devices used as inducements to keep producers from shifting markets, on the one hand, and to encourage producers to shift markets, on the other.

One of the most important questions in the use of Class I milk price formulas, therefore, is this. Can a formula be devised which will bring about the wide swings needed to keep Class I prices in line with economic conditions which will also adjust properly the relatively minor changes needed from time to time in price differentials between adjacent markets?

Prior to April 1948, each of the 30 federal orders in effect in the United States contained Class I price formulas based on the manufacturing value of milk. Although the exact measure differed from

market to market, the "movers" in all of these formulas were national in scope. If the price of butter in the United States increased sufficiently, as judged by quotations in large cities, it affected Class I prices in each of the 30 markets. The exact effect of a change in the manufacturing value of milk was somewhat different in markets which were far apart, e g., New York and Chicago, but the formulas were so devised that between adjacent markets, e g., between New York and Boston, or between Chicago and St. Louis, a given change in manufacturing value would cause similar changes in Class I prices, and usually identical changes.

These formulas, then, did not provide for automatic change in inter-market differentials. Fixed differentials were established by setting up specified dollars and cents amounts in formula schedules for each of the various markets.

Beginning in April 1948, three of the 30 federal order markets, Boston, Lowell-Lawrence, and Fall River, have used a Class I price formula based on a national index of wholesale prices, a local index of department store sales, and a local index of feed-labor costs as prime movers, supplemented by an escape provision based on local changes in supply and consumption of milk during the past year. Considering the prime movers only, two of the three are local factors. If similar formulas were adopted in all other markets, inter-market differentials would be adjusted from month to month on the basis of differences in movement in these two factors. The escape provision might cause counter movements in the differentials after several months had elapsed, but the initial and continuing adjusters would be the two prime movers which are local factors.

It is extremely doubtful if changes in inter-market price differentials resulting from the adoption of this formula in some or all of the other 27 federal order markets would be logical or reasonable, judged either from the empirical record or from the standpoint of economic theory.

The record indicates that department store sales in various markets have followed widely different courses from month to month and from year to year. Such differences have not been associated with varying rates of fluid milk consumption. In the six leading cities of the New York Federal Reserve District, seasonally adjusted indices of department store sales in June 1948, on a 1935-1939 base, were 264 in New York City, 226 in Newark, 314 in Buffalo, 299 in Rochester, 349 in Syracuse, and 226 in Bridgeport.

If Class I prices in these markets had been established under a formula giving indices of department store sales a weight of one-third, inter-market differentials would have formed considerably different patterns from those that have been experienced to date.

The record indicates that although feed-labor indices in various milksheds have followed a more nearly similar course over the years than have department store sales, the amplitude of the upward and downward swings becomes greater as one moves from the East Coast toward the Middle West. Such inter-market differences in feed-labor indices have not been associated with inter-market differences in supplies of milk, either in the short run or in the long run. Between April and July 1948, for example, the reported farm wage rate in Vermont increased by \$7.00 per month and the reported farm wage rate in New York increased by \$1.00 per month. This change has not yet caused corresponding changes in milk supplies in the Boston milkshed compared with the New York milkshed, and is not likely to cause corresponding changes in the near future.

Historical data thus suggest that automatic adjustment of inter-market price differentials would result in pricing chaos if the model now used in federal order markets in New England should be adopted in other markets. That such would result is also in line with what would be expected on the basis of economic theory.

Determining changes in inter-market differentials by these factors assumes that fluid milk consumption is closely related to department store sales, and that fluid milk supply is closely related to feed-labor costs. Since there are so many factors affecting fluid milk consumption and supply, these assumptions would not be expected to be true. The consumption of milk from a given supply, for example, is determined by the number of people obtaining supplies from this source and the per capita rate of use. The second of these determinants, per capita rate of use, is related to such factors as retail milk prices (affected by Class I price and distributor's spread), consumer incomes, age composition of the population, prices of other foods, and the degree of nutritional recognition of the food value of milk. Even if complete and accurate data were available on consumer incomes, changes in fluid milk consumption which occur over time could not be predicted with great accuracy because of the influence of other important factors.

The supply of milk in a given milkshed is determined primarily

by production in the region and inter-market shifts of producers and plants. Milk production in a region, the first of the two determinants, depends upon the number of cows and production per cow. Whether a farmer keeps cows depends on alternative opportunities, particularly in industry in those regions where near-by industrial employment is possible. The decision also depends on costs in dairy farming relative to the price of milk. Production rates per cow depend upon such factors as prices of feed; farm wage rates; weather as it affects pastures, crop yields, and hay quality; and the changing milk-producing capacity of the cow population. Since so many important factors are involved, it is not surprising that feed-labor costs are not closely associated with changes in supplies in a given milkshed.

An alternative method of automatically adjusting inter-market differentials among federal order markets is to base the adjustment on changes in actual supplies, and in actual fluid milk consumption from these supplies, in each of several competing markets. In considering this method, it should be kept in mind that the question of what prime movers are best suited for use in a formula is not discussed in this paper except to point out that they should be regional or national, not milkshed-wide, in character.

Suppose that on the basis of evidence presented at a joint hearing, it were decided that the basic Class I prices in Market A and Market B should be the same. Suppose that in Market A 40 percent of the milk supply during the most recent 12 months had been used in surplus classes, and in Market B, 38 percent. A schedule could be set up providing that as the 12-month moving average of the percentage utilization of the milk supply in surplus classes changed in one market relative to another, the inter-market differential should be changed. Some small amount, such as two cents per cwt., could be provided as the change in inter-market differential associated with a one point deviation in the two series of percentages. If the percentage of the supply used in surplus classes should increase from 40 to 42 in Market A, and not change in Market B, the Class I price in Market A would be reduced four cents per cwt. relative to Market B. Detailed study might indicate, of course, that the adjustment rate should be three cents, four cents, or some other figure instead of two cents.

The economic basis for this adjustment is the fact that as one market becomes short of supplies relative to another adjacent

market, milk should move from one market to the other. Even with the differences in blend prices which result from changing utilization, shifts of plants and producers occur only with significant lags because of institutional factors, and are resisted by the payment of special price premiums. It appears economically sound to provide an extra incentive by changing the relative Class I prices when one market becomes short of supplies relative to the other so as to overcome part of the lag in needed adjustment.

In conclusion, the question of inter-market price differentials divides itself into two parts: (1) The determination of the amount of differential at a given point in time, on the basis of evidence presented at public hearings, and (2) possible automatic adjustment in the differential within the framework of Class I pricing formulas. Presented in this paper is a discussion of the second question, together with a suggested method of adjusting inter-market differentials which appears to the author of this paper to have merit. Such method may or may not be preferable to inter-market differentials which are set at fixed amounts following joint hearings, and which do not change until evidence presented at another joint hearing warrants a different fixed amount.

PRICING CLASS I MILK UNDER FEDERAL ORDERS*

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THE search for "better" methods for pricing milk has been going on for a long time. The current crop of "experts" are unlikely to find *the* method except possibly in terms of the present situation. Five and ten years from now the environment in which milk prices function will be different and at least the details of pricing techniques will need to be changed.

Most economists and probably most producers and distributors have concluded that market place prices like those we have for grains and livestock cannot be made to work for fluid milk because of the nature of the product and the health regulations surrounding its production and distribution. At one time bargaining between producer leaders and the distributors appeared to be the perfect substitute for market place prices. Bargaining was done by those most intimately acquainted with the local effects of price making forces. All too often, however, the bargaining parties used only that part of their knowledge which would help them as farmers to get higher prices or as buyers to justify lower prices. Combined with honest differences of interpretation, this attitude of self-protection led to repeated failures of bargaining. The result frequently was arbitration by an impartial third party.

Public hearings with government taking over the arbitrator's position were only a short step from bargaining conferences. Hearings preserved the theoretical advantages of bargaining, namely, the introduction of evidence by those closest to the local situation and the opportunity to give consideration to all of the price making forces. But the legal formality of hearings plus frequent window dressing by witnesses for the benefit of their customers has detracted seriously from the so called advantages provided by public hearings. Even more important, the protracted delays incidental to using government as the arbitrator has made public hearings inefficient as the sole means of establishing prices.

More recently, Class I formulas have been devised and used. Until the adoption of the Boston formula this year, all Class I

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formulas in federal order markets had been based on the price of some one or combination of manufactured dairy products. The use of such prices, at least in mid-western markets, has been based largely on the direct competition between the fluid market and manufactured products for the milk supply. The result of this competition was a direct relationship between the price of the manufactured product and the price of milk in the fluid market. The Class I price was arrived at by adding a charge for transportation and a premium for meeting sanitary requirements to the actual or approximate price paid by manufacturing plants. The determination of a proper premium was the major problem in arriving at the Class I price.

In eastern markets the use of formulas based on manufactured dairy products was accompanied by greater difficulties, very largely because supplies of milk for manufacturing were less important and more scattered than in the midwest. The problem of determining a proper transportation allowance was difficult and the concept itself lacked complete validity. The logic of using manufacturing values because of direct competition for supplies had to be bolstered by the theory that changes in prices of manufactured products measured changes in the underlying supply and demand conditions affecting the whole of the milk industry. In the Northeast, with but little milk at present being produced in excess of that needed to meet fluid milk requirements—except for seasonal surpluses—Class I formulas based on prices of manufactured dairy products appear to have lost their usefulness.

Class I formulas are needed in federal order markets primarily in order to bring about promptness of price changes. Manufactured dairy products formulas have filled this need in many markets and in addition have performed another useful function of determining the level of prices even over considerable periods of time. Incidentally, they also took a lot of responsibility off the shoulders of producer leaders, handlers and government.

In developing a Class I formula the Boston Committee naturally tried to find some combination of factors that would function in the east as manufacturing values had in the mid-west, something that would dictate the level of the price as well as move it promptly. The relatively new type of formula the Committee developed uses several series of data in combination to reflect variations in the demand for and supply of milk. To date there has been no demonstra-

tion of a precise relationship over long periods of time between an adequate Class I price and indexes of any of the many series of data that might be used to reflect changes in demand and supply. Nor is it logical to expect a precise relationship to endure through inflation, deflation and technological change. When first proposed, the four series in the Boston formula were 53, 74, 98 and 104 per cent above their respective 1925-1929 averages. With very little scientific basis for weighting, it seems illogical to assume that a combination of these four factors will give the correct percentage change in the price of Class I milk since 1925-1929. I doubt whether this new type of formula, regardless of the factors it contains, can be used as a determiner of the proper level of prices over more than a brief period of time.

The basic idea which led to the selection of factors in the Boston formula undoubtedly will be copied by the Philadelphia Committee in whatever formula it recommends. The economic series used to reflect general economic conditions and changes in demand and supply peculiar to fluid milk, however, are unlikely to be the same ones, in all instances at least, as those used in Boston.

The Philadelphia Committee hopes to be able to work out a plan which will use regularly scheduled hearings to determine the level of prices plus a formula to change prices between hearings and to indicate the level of the price to be examined at the hearings. In this manner the Committee hopes to combine the advantages of both hearings and a formula. By using the indicated formula price as a proposal at each hearing it is hoped to cause the presentation of more adequate and related evidence and thus strengthen the functioning of the hearing process.

I have mentioned the lack of precise relationships between the Class I price and the various reflectors of supply and demand as one reason why hearings are needed to determine the level of the price in relation to the formula factors and then to examine periodically the adequacy of the formula price. There are other reasons. No formula of the Boston type will ever contain reflectors of all of the price making forces, and even if one does, the various reflectors will not be perfectly weighted. Furthermore, the relative importance of price making forces will change from time to time.

The Philadelphia Committee expects to recommend that price changes between hearings occur only as a result of major changes in the formula values. For example, if the price is set by the hearing

at \$6.00 when the formula index is 100 the price will not change until the formula moves by an amount equal to a change of twenty cents in the Class I price. Following the first such change after a price hearing, the price will not move again either in the same or reverse direction unless a similar major movement occurs in the formula value. The need for a price change, at least when the bracket system is used, is not indicated by the fact that a formula index reaches either 105, 110, or any other particular point but rather by the fact that a particular amount of movement has occurred. It is not where the formula index is but how much it has changed that is important.

A partial list of reasons why pricing methods should be expected to vary from one market to another would include differences in health regulations, in types of farming, in seasonality of production, in the leadership of producers' cooperative organizations and in the availability of unapproved milk supplies. Because of these differences, the Philadelphia Committee will make no claim of recommending the one and only method for pricing Class I milk. From my viewpoint the method used to price milk in Boston, and the methods which will be recommended by Committees in other markets are in the nature of experiments. One reason why I recalled a brief history of price determining methods was to indicate that such experiments have been made before and will need to be made in the future if pricing methods are to keep up with changing conditions.

PRINCIPLES FOR PRICING MARKET MILK*

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THE principal objective of a university is to assemble, discover, and disseminate truths which will be most useful in improving the standards of living of the people whom it serves. Hence, in setting down principles for pricing of market milk, the first question which a university researcher may logically raise is: *Is the proposed pricing policy in line with public interest?* Does it tend to encourage the maintenance and expansion of sales of market milk in line with nutritional needs? Does it tend to promote harmony between producers and dealers and to put a stop to milk strikes which in the past have been costly to all groups?

A second question: *Is the proposed pricing policy fair to the various interests involved?* Is it fair to farmers? Is it fair to dealers? Is it fair to labor?

A third question: *Is the proposed pricing policy workable?* A large number of proposals for policy changes are impractical because for one reason or another they would not be accepted by the groups affected. Eventual acceptance by both producers and dealers is essential to the practical operation of any milk pricing policy.

Keeping in mind the above facts, the following principles are suggested as a basis for determining the price of market milk used in whole form:

1. *Both milk and cream for any market should be produced in areas where costs of getting milk produced plus transport costs are the lowest.* If Minnesota or Illinois farmers can produce high-quality milk and transport it to Florida or Texas more cheaply than it can be produced in these states, it should be produced in Minnesota. From a public viewpoint, consumers are interested in getting high-quality products at reasonable prices. An underlying basis for the high standards of living in the United States has been the application of the "law of comparative advantage," wherein goods are produced in low-cost areas. Michigan and New York produce large quantities of apples, but no oranges; most of our oranges are pro-

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duced in California and Florida, where the natural advantage of climate results in low-cost orange production.

Cream can be shipped long distances at relatively low cost. Costs for hauling cream are about one-tenth of those for hauling market milk. Much cream is still being separated from market milk in several eastern markets. In New York City, for example, a major part of the cream used is obtained from milk produced in the New York milkshed. As a long-time program, it is good economics for eastern markets to use as market milk as large a proportion of its total production as possible and to make up shortages with shipments of cream from the surplus producing areas of the midwest. In some markets this will necessitate shifting of some producers from one milkshed to another or working out some method for intermarket shipments of milk.

2. *The price for market milk (Class I) should be established in a federal order so that it automatically goes up or down in line with some dynamic factor, such as prices of manufactured dairy products, consumers' income, other farm prices, or some combination of these price series.* During World War I there was an epidemic of milk strikes throughout the country accompanied by physical violence, dumping of milk, and much bitterness between milk dealers and dairy farmers over the question of pricing of milk. In sharp contrast to this situation, during the past eight years most markets have had no milk strikes and, for the most part, producers and dealers have worked together to use the milk produced in the best way possible to meet a shortage of this important product. Why this difference?

This difference can be attributed to: First to the nation-wide acceptance of collective bargaining between dairy farmers and milk dealers; second, to the operation of federal milk orders in some 30 markets in which milk prices have been geared to change automatically with changes in prices of manufactured dairy products; and third, to a 14-year period of rising prices.

3. *The price for market milk (Class I) should be established at premiums above prices of manufactured dairy products sufficiently high to get a blend price which will encourage enough but not too much milk to meet market needs. Bottom prices of manufactured dairy products should be kept as high as practical to prevent Class I prices being too high.* and to prevent dealers who handle a large volume of surplus milk from having an unfair advantage over dealers

whose purchases are largely for Class I sales. A monthly average of around 20 percent above Class I requirements is necessary to meet day-to-day changes in production and sales.

4. Since it is uneconomical to produce large quantities of Grade A or other high-priced milk to be manufactured into lower priced surplus products, *premiums paid for Class I milk above prices for manufactured dairy products:*

(a) *Should be larger in months of low production and smaller in months of high production to encourage an annual production more nearly in line with a market's need for milk and*

(b) *Should be raised on an annual basis if there is too little milk to meet whole milk requirements, and lowered if the blend price results in too much milk in the shortage months to meet whole milk requirements*

The Boston Milkshed Price Committee is to be commended for its action in providing for an automatic increase in Class I premiums when production in relation to Class I sales is too low and a decrease in these premiums when production in relation to Class I sales is too high.

To stimulate thinking, on July 8, I presented an application of the Boston principle of flexible premiums at a federal order hearing in St. Louis. Present St. Louis premiums above condensery prices are \$1.35 per 100 pounds from July to December, \$1.10 from January to March, and 90 cents per 100 pounds from April to June. A study of St. Louis production and sales in recent years showed that a surplus of 28 percent above Class I sales was necessary to provide a necessary monthly surplus and seasonal surplus.

The adjustments suggested were: (1) If actual surplus for the past year is less than 28 percent above Class I sales, add 2 or 3 cents per 100 pounds for each percent that actual surplus is less than 28 percent, if actual surplus were more than 28 percent above Class I sales subtract 2 or 3 cents per 100 pounds for each percent that actual surplus exceeded 28 percent. Additions or reductions to premiums would be effective for each of the next 12 months.

This method would provide an automatic change in premiums above condensery prices every year, and each year call to producers attention the importance of producing enough but not too much milk to meet Class I needs.

The computations for arriving at the amounts that would have been added or subtracted from premiums paid for Class I milk

above the 23 condensery average price in the St. Louis market from 1941 to 1947, are shown as follows

Year	Proportion that Class I sales were of total production	Actual surplus above Class I sales	Necessary plus seasonal surplus base period 1941-47	Amount actual surplus was above or below 28 percent	Amount that Class I price would have changed if adjustments had been made	
					At 2 cents for each percentage	At 3 cents for each percentage
	(percent)	(percent)	(percent)	(percent)	(per 100 pounds)	
1941	62	38	28	-10	\$- 20	\$- 30
1942	77	23	28	+ 5	+ 10	+ .15
1943	88	12	28	+16	+ 32	+ 48
1944	83	17	28	+11	+ 22	+ 33
1945	84	16	28	+12	+ 24	+ 36
1946	89	11	28	+17	+ 34	+ 51
1947	88	12	28	+16	+ 32	+ 48

ROUNDTABLE ON EFFECTS OF TECHNOLOGICAL CHANGES ON COST REDUCTION IN AGRICULTURE

Chairman: Sherman E. Johnson, Bureau of Agricultural Economics

EFFECTS OF TECHNOLOGICAL CHANGES ON COST REDUCTION IN AGRICULTURE: RECENT AND PROSPECTIVE CHANGES*

GLEN T. BARTON

Bureau of Agricultural Economics

RECENT and prospective changes in technology and cost reduction in American agriculture can best be appraised against the background of changes over the last quarter of a century. Violent fluctuations in the price level over this period have obscured the significant effects of such changes. Recent studies of the Bureau of Agricultural Economics, which involved construction of series of constant-dollar costs of production or production inputs, and other related data, provide the basis for a broad examination of technological forces and cost reductions for United States agriculture as a whole.¹

Since World War I all inputs per unit of farm output in the United States have been reduced by 25 percent. During this period total production inputs—land, labor, machinery, and other materials valued in constant dollars—increased about 15 percent, and the volume of farm output rose by 50 percent. Reductions in inputs per unit of output were due mainly to the rise in volume of output, not to a decrease in total production inputs. Both the rise in output and the increase in production efficiency resulted mainly from technological forces that raised production per farm worker and per man-hour, per crop acre, per breeding unit of livestock, and per unit of farm power and machinery.

Although the upward trends in efficiency of farm production are definite and long-time, some cyclical movements appear to have been conditioned by war and depression and the accompanying variations in economic conditions. Total production inputs rose slightly during and following World War I when farmers were

* A paper given at the Annual Meeting of the American Farm Economic Association, Green Lake, Wisconsin, September 14, 1948.

¹ See U.S.D.A. Miscellaneous Publication 630, *Progress of Farm Mechanization*, by Martin R. Cooper, Glen T. Barton, and Albert P. Brodell.

beginning the transition from animal power to mechanical power and equipment. During the depression and drought period of the 1930's, total inputs declined. Over the interwar period as a whole, however, total production inputs changed very little, while volume of output generally rose.

The World War II period witnessed an unprecedented rise in farm output. Total production inputs also increased as farmers added greatly to their inventory of power and machinery, doubled their use of fertilizer, and generally increased the use of production goods necessary to our modern way of farming. The long-time downward trend in inputs per unit of output continued during the early part of the war. Since 1942, however, total production inputs have continued to climb chiefly because of increased mechanization, while volume of farm output has not increased nearly so much. As a result, there has been a halt in the decline in inputs per unit of farm output.

There is every reason to believe that technological forces will effect further reductions in inputs per unit of output over the longer period ahead. But this may not be the case in the next few years of transition. Farmers are better stocked with power and equipment in relation to cropland area than at any other time on record. Compared with 1940 farmers now have more than twice as many tractors, combines, mechanical corn pickers, and milking machines, and nearly 50 percent more total power and machinery. And they are likely to continue to add to machinery inventories as long as farm incomes remain high. Inputs of power and equipment will increase, probably by a greater amount than inputs of farm labor decrease, as mechanization proceeds to smaller farms, and as larger farms are further mechanized.

It is physically possible to expand farm output considerably in the space of a few years by greatly increasing the use of fertilizer, and by more intensive and widespread use of known improved production practices. But even with the further mechanization that is in prospect our farmers are not likely to increase total output greatly in the immediate future. Favorable weather has played an important part in the high level of farm output in recent years. Further advances in the technological forces which raise crop and livestock yields may have to compensate for a return to average growing conditions during the next few years. With moderate increases in output, and a continued high level of production inputs,

inputs per unit of output may show little change, and may actually increase in the immediate future.

Over the next generation the long-time trend in efficiency of farm production or cost reduction should persist. Farmers will be able to increase their production at least as fast as our total population increases. Undoubtedly there will be a further replacement of horses and mules by mechanical power. This will add another 15 to 20 million acres of cropland to the more than 55 million acres already released from production of feed for workstock to output of products for the market. But replacement of animal power by mechanical power will have a gradually decreasing effect on farm output as the number of horses and mules approaches a minimum. On the other hand, greater timeliness in farming operations owing to increased mechanization will add to our annual output.

Continued downward trends in total labor requirements and in farm employment seem certain. Net change in the total area of our cropland is likely to be slight. Production per acre will probably show an upward trend because of even greater use of fertilizer, lime, better seeds, and soil-building practices, and of new improved techniques not now on the horizon. In short, the next generation should witness a continuation of the technological forces that have resulted in reductions in inputs per unit of output over the last generation.

The future rate of decrease in inputs per unit of output may not be as great as in the last quarter of a century. More of the increased mechanization in the future may have to be charged to less drudgery and more comfortable working conditions, rather than to increased production efficiency. Labor-saving machines may be costly and less efficient on smaller and less productive farms. But in many instances these machines may provide the farm operator with free time to engage in profitable nonfarm work.

If past trends in the composition of production inputs continue, our farm people will pay cash for an increasing proportion of their production inputs. With a high percentage of cash production costs, farmers will be increasingly vulnerable to future fluctuations in prices of production goods and in prices of farm products.

EFFECTS OF TECHNOLOGICAL CHANGES ON NORTHEASTERN AGRICULTURE*

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TECHNOLOGICAL innovation in Northeastern agriculture has taken place in a system of farming long established and, in some respects, considerably matured under the patterns of regional competition and the farming methods of an earlier day. As far back as the turn of the century, agriculture in the Northeast, had already attained its maximum expansion in number of farms, farm acreage, and even in number of dairy cows.

And by no means is the technological change all of recent vintage. Strong forces were at work at least as early as 1870. A rising degree of commercial production was steadily displacing the traditional, highly self-sufficient Down-East farm economy. Horse-powered equipment was rapidly introduced, and improvements, both in crops and livestock and in crop and livestock management, were much greater in this early period than is now generally acknowledged. Perhaps the most outstanding example of the improvement was a 70 percent increase in milk production per cow between 1870 and 1900—nearly twice the increase in milk yield that has been accomplished in the Northeast by all the cow and cow management improvements since then. The total of such developments in the 30 years prior to 1900 resulted in a 50 percent increase in the crop and livestock output of the eleven Northeastern states.

But technological changes in transportation and in food processing and handling were then adding to the competitive pressures on Northeastern farmers. In the 30 years following 1900, Northeastern farm production increased only 12 percent. One acre in four of the land farmed at the beginning of the century had been abandoned by 1930. One in four of the farm labor force had moved to other areas or other jobs as alternative employment came to look more attractive than the opportunity on many of the less productive farms. Such evidence indicates that agriculture in the Northeast had retracted even before the Great Depression.

* A paper given at the Annual Meeting of the American Farm Economic Association, Green Lake, Wisconsin, September 14, 1948.

More recently the increasing tempo of technological change has been a revitalizing shot in the arm. Crop and livestock output increased 28 percent from the early Thirties to the mid-Forties. Farm acreage remained essentially unchanged. But increased mechanization both in the fields and at the farmsteads, improved breeding and feeding practices, better disease and pest control, improved crop strains, a near doubling of fertilizer usage, and similar advances, have boosted output per acre, per animal, and per labor hour. Marked shifts have taken place in the combination of production factors, and the technical problems of management have been sharply increased.

How much unit costs of production have been reduced by these changes in Northeastern agriculture we do not have evidence to show. But physical inputs per unit of output, at least on some important Northeastern enterprises, have decreased sharply.

For example, during 1914-18, hens on New York cost-account farms laid an annual average of 87 eggs. In 1929-33, production per bird was up to 135 eggs, and in 1939-44, up to 163. Production per labor hour increased from 54 eggs in the World War I period to 96 eggs in the early Forties. Feed consumption in the laying flocks was 9.2 pounds per dozen eggs in 1914-18 and 7 2 pounds in 1939-44.

Assuming comparable changes throughout the Northeast; if the 533 million dozen of eggs produced in the eleven states in 1944 had been produced at World War I rates of feed and labor efficiency, feed consumption by the laying flocks would have been greater by 500,000 tons. Labor requirements in egg production alone would have been greater by 48 million man-hours. While labor required to produce the additional feed *and* to care for the hens would have been equivalent to year-round work for 20,000 farm workers.

Another example of increased output at low cost is the use of DDT for potato leaf-hopper control. This insecticide is apparently adding 10 to 15 percent to acre yields at a rather insignificant cost increase over the spray schedule formerly applied.

Then, of course, there is the shift from horses to tractor power. Northeastern farmers have decreased horse numbers relative to their crop acreage even more than the national average. From World War I to World War II, New York cost-account farmers reduced the number of horses on their farms by 55 percent, but they

decreased the number of horse-hours worked by 75 percent. Many farmers are keeping a last team of horses on the farm out of sentiment, but have retired them to pasture (on horse social security) where they will live out the rest of their days. A farmer cannot pay going wages, or earn the equivalent himself, and slow up accomplishment as is done when horses are used. At cost-account farm rates during the early Forties, it cost \$5.50 an acre for labor, power, and equipment to plow an acre with horses, but only \$2 an acre with a tractor. Northeastern farmers now have more tractors per hundred acres of cropland than does any other region of the country—not because they have need for more tractor power per farm but because many farms with tractors have only a few acres of crops, and still the tractor is cheaper than horses.

Item after additional item of crop and livestock improvement or of innovation in production method and equipment might be added until the total became truly indigestible but each one would merely illustrate the same story in greater or lesser degree.

Agriculture in all regions of the country is in a tightspun upward spiral of technological progress. Every commercial farmer is under pressure to keep up with the rising tempo of innovation or he will lose out on a unit-cost-of-production basis to other farmers who push on ahead. That is as true in the Northeast as elsewhere.

Perhaps it is even more true. Because of its very large urban population the Northeast produces only a third of the food consumed in the region. Other areas are already geared to shipping large quantities of produce to Northeastern markets. If the farmer in the Northeast does not keep up with the advancing technology that is applicable to his business, he may soon face difficulty in the market and have an increasing problem in squeezing a profit from between *his* unit costs and the market price.

The probability is we have only begun to see the technological changes that will come in the years ahead. They will continue to change farm organization, factor combinations, and management problems. They will continue to boost farm output, and probably to reduce total inputs relative to outputs. Whatever net contributions are made to success in farm operation and to national welfare, there will be many problems for farm economists growing out of the changes.

EFFECTS OF TECHNOLOGICAL CHANGES ON COST REDUCTION IN AGRICULTURE: EFFECTS IN THE MIDWEST*

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IN GENERAL the characteristics of agriculture in the north central states have favored rapid and widespread technological changes. Such changes have either increased the product per acre of land or animal unit, or decreased inputs of production factors, particularly labor. More than thirty years of cost accounting in Illinois, mainly by R. H. Wilcox, provides a good deal of information regarding the effects of technological changes throughout the Midwest.

Crop Yields

During the 1920's corn yields on Illinois cost accounting farms were rather stable at 45 to 50 bushels per acre. Yields were low in 1933 as well as in 1934 and 1936. Beginning with 1937, yields increased phenomenally to a three-year average peak of 70 bushels in 1941-43. It is estimated that the complete shift to hybrid seed accounts for a 20 percent increase in yield: this is about half of the increase on the accounting farms from the level of the "twenties." The other half of the increase was the result of favorable growing seasons, increased mechanization, and better land treatment, including legumes and fertilizers. In several of the years of highest yields the planting season was quite unfavorable, but mechanization made it possible to get the crops in the ground on short notice when the rains stopped. Even in a normal year the better seed beds and more timely planting made possible by tractor power have a certain but undetermined effect on yields.

Soybeans were first grown for beans on Illinois cost account farms in the early "twenties." Early yields averaged 15 to 20 bushels per acre. Yields increased steadily to a three-year peak of 30 bushels in 1937-39. New varieties had an important effect. Also it was a case of farmers learning how to grow a new crop. The fact that these particular farms were rather highly mechanized enabled them to quickly acquire the "know-how."

* A paper given at the Annual Meeting of the American Farm Economic Association, Green Lake, Wisconsin, September 14, 1948

Yields of oats and wheat have also increased on these farms, but in neither case has the increase been as striking as for corn between 1937 and 1942 or for soybeans between 1928 and 1938. From the rapid rate at which improved varieties of oats are being extended at the present time it looks as if the effect on average yields may be comparable to that of hybrid corn.

The purchase of fertilizers has increased a great deal, particularly in the past five years. The effect of these fertilizers on yields of the accounting farms is obscured by the fact that yields of both corn and soybeans have declined in recent years. It should be noted that the cost account farms are in an area where corn and soybeans production have been particularly intensive; the two crops have been grown on about three-fourths of all tillable land. Lower yields reflect this intensive use.

Labor and Crop Production

The most striking effect of mechanization has been the reduction of labor in crop production. On cost account farms the hours required to grow and harvest an acre of corn has steadily declined from over 18 before the days of the tractor to between 6.5 and 7 hours now that the horse has been almost entirely displaced in corn production. In soybean production labor requirements declined from 13 hours per acre in the early 1920's to just over 4 hours in 1936. This was the period of rapid expansion of the combine; incidentally, we would not have had the rapid expansion of soybeans in the corn belt except for the combine. Since 1937, when the last soybeans were threshed on the cost account farms, average labor inputs per acre have not changed.

Changes in Livestock

Although the effects of technological changes in livestock production are not as spectacular as those in crop production, they have been significant. On Central Illinois cost account farms the corn required to produce 100 pounds of hogs declined from 502 pounds in 1920-24 to 421 pounds in 1942-46. Better breeding, better feeding, and better control of parasites and disease all contributed to the decline in corn requirements. Better feeding is indicated by an increase in the tankage equivalent per 100 pounds of pork produced from 15 pounds in 1920-24 to 26 pounds in 1942-46. Better sanitation and better feeding are indicated by an in-

crease in pasture charged to the hogs from .5 to 4.2 animal unit days per hundred-weight produced. On the cost account farms, which are not in a major hog area, there has been no significant change in the labor requirement on hogs

Dairy cost studies have been made in Northern Illinois at three different periods, 1911-12, 1927, and 1936-37. Milk production per cow averaged 6,800 pounds in the first study, 8,000 pounds in the second, and 8,300 in the last. The quantities of concentrates and hay fed per cow remained about the same; quantities of silage and other roughage declined materially. The days of pasture were materially increased and the quality greatly improved. Improved breeding, disease control, and better feeding have materially increased efficiency in milk production. In better feeding the increased use of improved pastures has been a major factor. In the studies referred to labor per cow declined from 161 hours in 1911-12 to 118 hours in 1936-37.

Increase in Cash Costs

Particularly in crop production the effect of technological changes has been to increase the proportion of cash costs. According to Wilcox about 75 percent of the cost of producing corn today represents a cash outlay, including the purchase price as well as operating costs for machinery. This compares with only 35 percent in 1913 to 1915. In soybean production 70 percent of the cost is cash outlay compared to 45 percent in the early 1920's.

EFFECTS OF SELECTED CHANGES IN TECHNOLOGY ON WESTERN AGRICULTURE*

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A STEADY progression of technological advances affecting western agriculture has resulted in sharp changes in factor ratios and labor efficiency. The major developments affecting western production, mainly tillage and harvesting equipment and tractor power, have, of course, been common to other sections of the country. Other common developments having notable effect in the West are the mechanical potato picker, power orchard sprayers, and in the chemical line, the recent applications of D.D.T. and weed sprays. Biological developments in agricultural production have likewise played a major part on a broad front in maintaining agricultural output and reducing unit costs.

Limitations of time and facts preclude a broad survey of the effects of technological changes on western agriculture. Consequently, it seems appropriate to concentrate primarily on important changes in the farm economy of the Palouse wheat-pea area of Washington and Idaho which have been associated with technical changes between 1919 and 1944. Comparisons for this period are derived from data obtained from comprehensive farm records taken from what are believed to be a representative group of Palouse farms during 1919 and 1920 and during 1942 and 1944.¹ The years between the wars witnessed the almost complete displacement of horses and mules by tractors; first, the wheeled variety and later, track laying tractors. This change was accompanied by the abandonment of threshing machines in favor of successively improved combines. In addition, there have been many other developments in tillage machinery made possible by the introduction of tractor power. The hilly Palouse with its deep, wind blown loam soil was well adapted to these large scale changes in technology.

Sharp changes in factor relationships accompanied or closely followed the technical advances. Average farm size, as indicated

* A paper given at the Annual Meeting of the American Farm Economic Association, Green Lake, Wisconsin, September 14, 1948.

¹ Keith Carter, recent graduate student at the State College of Washington, prepared work sheets from which these data were taken.

by crop acres, increased from 291 acres in 1919-1920 to 498 acres as of the 1942-1944 average. This average increase of almost 70 percent in crop acres per farm was accompanied by an average increase of only 0.2 of one man equivalent per farm. For the earlier period, 1.8 average man equivalents per farm were reported as against two man equivalents per farm in the latter period. Accordingly, the average crop acres per man increased from 160 crop acres to 250 between the two dates.

The shift from horses and mules was reflected by the Palouse farm data which shows an average value of horses and mules on farms in 1919 and 1920 of \$1,230 and a negligible value in 1942-44. Power equipment, on the other hand, reported as negligible in the earlier period averaged \$2,600 in 1942-44. Average machinery and equipment investment per acre increased from less than \$5 00 per acre to more than \$10.00 per acre between the two dates. Average machinery and equipment investment per man, of course, increased even more strikingly as the figure rose from \$700 to \$2,600 during the period. Average total capital per farm which increased from \$50,000 to \$71,000 reflected the increased quantity and value of machinery and power equipment, as well as the increase in number of acres operated per farm. Land values were higher in the earlier period standing at an average of \$154 per acre for 1919-20 as against \$124 per acre average for 1942-44. Real estate, which constituted 90 percent of the value of all capital per farm in the early period amounted to 87 percent in 1942-44.

Machinery and equipment, on the other hand, increased from less than three percent to more than seven per cent of total average capital.

Changes in net farm income considered as the return to capital and management were no less striking than were the physical relationships already considered. The increase in average net annual farm income from below \$3,000 to almost \$17,000 was not attributable alone to changes in technology. During the 1919-20 period almost one-third of total crop acreage was reported in summer fallow. This is in sharp contrast to the approximately five percent of the crop acreage report in summer fallow in the 1942-44 period. A very large part of this shift away from summer fallow represented crop acres put to growing dry field peas. It appears that the great war period demand for dry peas was largely responsible for the

substantial increase of this crop which sold at highly remunerative prices ranging up close to \$5.00 per 100 pounds.

Expanded net farm income in the wheat-pea area, as between the dates under consideration, took place notwithstanding relatively less favorable price relationships during the latter period. During 1919 and 1920 the Washington State wheat price index, on a 1910-1914 base, was about 50 points above the index of prices paid by farmers. In marked contrast, the 1942 and 1944 price relationships show the Washington wheat price index lagging prices paid by farmers by about 25 points. This disparity between wheat prices and prices paid by farmers was, of course, adequately corrected subsequent to 1944 and the farm income experience has happily improved.

Continued development in chemical techniques for weed control may provide a further important cost reducing improvement for this area, which still leans heavily upon costly fallowing practices is the leading method of weed control.

Aside from important improvements in pest and disease control materials and methods, the fruit industries of the West have made relatively little gain in a technological way. Livestock production is, of course, even more noteworthy in this respect

TECHNOLOGY AND THE COST STRUCTURE ON SOUTHERN FARMS*

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THE current turning point from shortages to numerous surpluses finds much of southern agriculture in the throes of continuing transition from mule to tractor power, from declining specialization to further diversification, and from small to medium-sized operating units. These circumstances present an involved setting for consideration of the "push" and "pull" of technological advancements and the farm-costs structure in the South.

Technology, Production Combinations, and Costs

Clarity is gained by differentiating between two main groups of technological advancements which affect production combinations and in turn the costs structure in farming. Group I consists of simple technological changes. They can be made within the framework of prevailing sizes and types of farms. These advancements increase output and lower unit costs without substantially altering the factor combinations. As long as market gluts are avoided, simple technological advancements increase returns to each of the factors of production. After a time lag, downward adjustments in price reflect a part and sometimes all of the lower costs. Individual enterprisers who adopt new varieties or increase the rate of application of nitrogen fertilizer at an early stage take advantage of the time lag before widespread adoption of the improvement and for a while they increase their own net income in both an absolute and a relative sense.

In general, the simple technological advancements of group I do not affect overhead costs directly, but they do change variable costs directly and substantially. Obviously, a 30-bushel per acre increase in yield of corn brought about by the addition of 60 pounds of nitrogen at approximately 12 cents a pound means lowered costs. The new organic insecticides for control of boll weevils, aphids and boll worms, such as benzene hexachloride and chlorinated camphene, lift the yield ceiling for cotton with very little

* A paper given at the Annual Meeting of the American Farm Economic Association, Green Lake, Wisconsin, September 14, 1948

increase compared with the costs when calcium arsenate plus nicotine is used. Anhydrous ammonia applied directly into the soil as a source of nitrogen upon approximately 500,000 acres of cotton lowered variable costs on those farms. From the standpoint of crop responses, anhydrous ammonia gives results equivalent to ammonium nitrate pound for pound of nitrogen. A pound of nitrogen costs about 7 cents in ammonia and approximately 12 cents in nitrate form. Handling ammonia with pressures between 200 and 250 pounds per square inch means that costs of farm storage and field application are higher than for dry nitrates, but these costs will not absorb more than half the difference.

On southern farms, as elsewhere during wartime "shortages," production was extended much beyond lowest costs combinations. Therefore, the pull for simple technological advancements reflected the larger volume of production at more nearly the highest profit combinations. Shortages of fertilizer and labor also stimulated many farmers to seek new techniques. Unfortunately, the potential supplies of cotton and flue-cured and dark tobaccos may again result in a situation in which simple technological advancement must push its way into production combinations strictly from a costs standpoint. This may have to come in the face of reduced volumes per operating unit and in the aggregate for many products.

Farmers in cotton-growing areas are unlikely to gain directly, compared with other areas in the United States, in terms of relative levels of income from simple technological advancements. Actually, limitations growing out of the fact that such a large segment of costs for cotton and tobacco are costs for hand labor will probably cause producers of those crops to fall farther behind when only simple technological advancements are considered. The greatest contribution that simple technological advancements can make toward improving the cotton situation in the United States is by improving the competitive positions through lowered costs and prices for that fiber in relation to synthetics and foreign-grown lint. A large share of the direct benefit therefrom will accrue to consumers of cotton goods rather than to cotton farms so long as the basic production combinations remain about as they are now. Recognition of mutual interests by producers and consumers of cotton is imperative. Unfortunately, an approach through price alone will not work toward the long-term best interests of either.

Complex Technological Advancements

Group II, or complex technological advancements, alter factor combinations substantially and change considerably the share going to each factor of production. Their adoption requires the reshaping of a high proportion of existing sizes and types of farms. Generally, complex technological advancements increase the output of the individual farm and the income of the individual enterpriser, but they may or may not increase the output at a given price for a particular farm product. Their effect upon total output for a product depends upon natural limitations to effective use of new methods and upon shifts in relative profitableness between enterprises with new methods. Inevitably, they affect in far-reaching ways both overhead and variable costs.

Complex technological advancements change both the capacity and efficiency of the factors of production in their relationships to one another.¹ The spindle type of cotton picker changes the capacity of labor for capital from 1 laborer in combination with a 3-dollar pick sack and approximately 5 dollars additional capital investment for scales, trailers, and other service items per hand picker to 1 driver in combination with a \$7,800 machine. One man picking by hand would commonly harvest 150 pounds of seed cotton or approximately a third of the yield from one acre in one day. The picker and its operator would gather 7,500 pounds of seed cotton in one day in cotton yielding 450 pounds of lint per acre. Similarly, the capacity of labor for management would be altered.

But mechanical pickers alter the basic combination of production factors for only one operation—that of harvesting. Either hill-drop planting or cross-cultivation may be used to eliminate hand chopping in obtaining a desirable stand. The one remaining peak load for hand labor in production of cotton in the “rain-grown” areas is the control of weeds. Prospects are promising for effective use of chemicals, particularly petroleum derivatives, to control grasses in cotton. This may eliminate the remaining hand operations. Taken alone, any one of these innovations will affect somewhat the contributions and the returns to particular factors in cotton production. Fitted together into a fully mechanized production system, the large seasonal labor demands for cotton

¹ Capacity and efficiency used as dimensions of productivity, J. D. Black, A. G. Black, *Production Organization*, Henry Holt Co. (New York, 1939) 157.

eventually may be eliminated. With mules for power and family aid in hand hoeing for weed control and picking, one man can handle about 10 acres of cotton, and a little corn in addition. With full mechanization, assuming the development of mechanized weed-control techniques that are effective, one man may be able to handle 100 acres of cotton plus a substantial acreage of small grains, grain sorghum, or soybeans in the alluvial areas. With these complex technological advancements, the capacity for labor of alluvial land in the Mississippi Delta would be greatly reduced; for capital it would be greatly increased, and for management it would be altered in kind.

With current transition forces at work, the necessity of hand labor for weed control, and the high prices of mechanical equipment current costs on southern farms are extremely high. As in the case of simple technological advancements, the pull for mechanization has reflected profit combinations that are not coincident with minimum costs and shortages of labor. It would appear that supply accumulations during the next 2 or 3 years will mean that mechanization and other complex technological advancements will have to push their way into farming systems strictly upon a cost-lowering basis. Serious complications and high financial risks will arise in this process, as mechanical power and equipment require large initial investments and higher cash operating costs. Larger cash reserves will be necessary and chances for financial disaster for the individual farmer will be greater during periods of low prices.

Time limitations do not permit a review of the probable effects of technology upon factor efficiency. But, as progress is made toward mechanization on cotton farms and elsewhere in the South, the reflections in costs of economically efficient combinations of factors will provide the key to higher incomes considered both in the absolute sense and in relation to incomes on farms in other areas. Production coefficients and cost ratios for varying qualities and quantities of factors used in combinations are yet to be determined for many aspects of cotton mechanization and other complex technological changes. They represent the job ahead for agronomists, engineers, and economists. They must become the basic data for appraisals of complex technological advancements and their relationship to farming costs.

PANEL DISCUSSION ON WORKSHOPS*

WORKSHOPS A LEARNING PROCESS

JOSEPH ACKERMAN
Farm Foundation

THE Farm Foundation recently has become interested in helping to sponsor workshops in land tenure research, farm management research, and in extension problems. The first of these held in 1945 brought together a small group of people interested in land tenure—and subsequent workshops have been held in tenure research each year. These, as well as the farm management one held this past summer, will be referred to later and discussed in more detail by other members of the panel. It is from the experiences of these workshops that I want to tell you something of the philosophy, objectives, and possibilities of workshops as a means of improving techniques in agricultural research and administration.

A workshop, in the sense we use the term, is a meeting of a group of individuals over a long enough period that they can think and plan together. They exchange ideas, obtain new slants on old problems, and revitalize their techniques to do better work on what they are doing.

There is no uniform pattern for a workshop—nor is the technique a completely new department in educational theory. In fact, activities somewhat similar to those carried on in workshops have been held under different names for quite some time. The workshop technique is an effort to utilize all of the resources and methods available in order to provide that combination of experiences which will most effectively meet the needs of those who participate.

Workshops are designed to give those who attend an opportunity to work on important problems without the interruption of the telephone, classroom lectures, seminars, and the like. It provides an opportunity not only to develop projects and investigate problems of individual significance but also enables one to get ideas from others and exchange significant experiences by working on similar problems

As most of you know, my work in the Farm Foundation has given me an opportunity to become acquainted with the agricultural

* A panel discussion at the Annual Meeting of the American Farm Economic Association at Green Lake, Wisc., September 14, 1948.

economics research, both past and current, in most of the land-grant colleges. I have counselled particularly with those working in the field of land economics, and farm management. Early in my explorations of the research work I became impressed with the need for more emphasis on methodology. Too few colleges offered specific courses in research theory and none coordinated agricultural theory with research methods. Students were expected to do a job of problem investigation without an adequate background. Moreover, it appeared that land economics research was not receiving adequate emphasis in many colleges.

It seemed desirable, therefore, to stimulate some general interest in this phase of agriculture. The matter of what to do was discussed with several people and frequently with Director Noble Clark, administrative adviser to the North Central Land Tenure Committee, and the late George Wehrwein, Professor at Wisconsin. All of us appreciated that the regional land tenure conferences we were helping to sponsor did not achieve the purposes of improving individual research as rapidly as was desirable. There was need for bringing together a small group, for a period sufficiently long to provide an opportunity for them to become really acquainted and to take an active part in discussions. A two-week workshop seemed to offer possibilities. It would provide stimulation for group discussion, offer opportunities for individual conferences about specific problems, and furnish a well-rounded program of experience through the interplay of professional, recreational, and social contacts. It would advance the understanding of research methodology and economic theory and indirectly would improve research in land tenure.

The ability to communicate with one another is improved as people become acquainted. A real effort should be made for good fellowship. To do this families of the participants have been invited and urged to attend so that a feeling of relaxation and well-being can be attained. Singing and general jollity around the dinner table, campfire, or beach contribute to the ability to communicate with one another and give a feeling of relaxation, confidence, and security, which is important to personal as well as professional life. This ability to communicate with one another helps in attacking the real problems, situations, or interests of the various participants. In order to induce this relaxation of mind which helps in the exploring of new avenues of approach, it seems well to have the

meeting at a place located away from institutions and the hustle and bustle of the busy city in an area which provides recreation and yet does not distract participants from the problems under investigation.

As originally conceived, and as the workshops have materialized, it is very important to have a program balanced between discussion, recreation, and individual meditation. The program is recommended by a planning committee after the critical and suggestive report presented by an evaluation committee has been digested. Generally, though, the program is informal and flexible enough so that changes can be made as work progresses and as the steering committee (which meets daily during the workshop) sees fit. The idea is to have the greatest possible interest and participation by all who attend.

After the first land tenure research workshop, which was held in 1945 with six men taking part to see what could be done, a proposal was made to the North Central Land Tenure Committee and to the directors of the agricultural experiment stations that a workshop be held in 1946. It was suggested that younger workers in agricultural economics be invited. Such a workshop was held at Land O'Lakes, Wisconsin, in 1946 and 20 men attended. The major emphasis was upon principles of research methodology with a minimum emphasis on subject matter. The participants were unanimous in their decision that another workshop be held, and in 1947 a group of 21 men met at Holiday House, Eldon, Missouri. Again emphasis was upon research theory but more time was given than in 1946 to the application of theory to specific land tenure problems. Time was spent on the matter of conceptionally analyzing the problems, setting up the problematic situation, and stating the working hypotheses. It was felt, however, that considerably more needed to be done in the application of the principles of methodology to specific problems. Therefore, at the 1948 workshop held at Science Camp University of Wyoming and attended by 30 men, emphasis was given to the application of methodology to the planning of a project.

The North Central Farm Management Research Committee recommended that a workshop be held to emphasize the use of farm records in research work. This was done this past summer and attended by 21 men. As plans developed, it seemed that emphasis should be on research methodology.

I would like to emphasize that methodology as discussed at these

workshops is not something fundamentally different from that used by agricultural workers in the past. It is primarily a shift in emphasis. Major attention is placed upon the need for a complete conceptual analysis of the problem prior to actually doing any field work or gathering any data. More emphasis is given to the planning stages, defining the problem, and formulating the hypotheses. More thorough planning results in narrowing the problem so that it is manageable and understandable. This makes possible a better analysis of the problem and more accurate interpretation.

In addition to the land tenure and farm management workshops, the Farm Foundation has contributed to and participated in a number of workshops arranged by the Extension Service of the United States Department of Agriculture. During the past five years the workshop technique has been used a great deal and at an increasing rate by extension people for an intensive study of their problems. Three workshops for administrative leaders have been held; the first in cooperation with the University of Minnesota was in 1942; the second, at the University of Wisconsin in 1946; and the third, in cooperation with the University of Louisiana in 1948. These workshops provided a convenient, stimulating means of interchanging ideas and practical administrative experience in the solution of common problems of management and operation confronting administrators.

In addition, the Farm Foundation has participated in and contributed financially to a home demonstration leaders workshop held at Purdue in 1948. Emphasis was on: (1) administrative responsibilities assigned to state home demonstration leaders and personnel for home demonstration work, (2) program development, (3) educational programs in newer fields, (4) evaluation of home demonstration programs, and (5) organization of county and community to reach more people.

We also assisted in arranging and participated in a week's workshop on farm and home planning, held at the University of Illinois in 1948. Consideration there was given to making a farm and home planning approach to extension better understood.

We have also participated in the Northeastern Extension marketing workshop held at State College, Pennsylvania, April 19, 1948 and will participate in the Midwest marketing workshop to be held at Ames, Iowa, October 1-7, 1948.

A workshop is really a way of learning and living together—of

sharing democratically. Out of the experiences of the workshops held during the past three years somewhat of a pattern has developed which offers real possibilities. Each morning, except Sunday, an intensive four-hour session is held, sometimes for the groups as a whole and part of the time for subcommittee work. In the afternoons individuals get together for discussions and recreation. There are one or two night sessions during the period of the workshop. In addition one or two afternoons are spent in visiting farms in the area.

Working in a group helps to clarify problems and to delineate fields of research. A great deal of planning prior to the workshop is necessary, so that all of those in attendance have an opportunity to give some thought to the problems before their arrival. If one is to intelligently discuss problems with others, it is necessary to think through just what one hopes to accomplish and to explore the broad, basic principles that have a bearing upon the problem. By conceptionally analyzing a problem before beginning to investigate, one is more likely to arrive at an accurate answer to the problem. Group thinking applied to research problems gives a balanced approach to the basic aspects of theory and facts.

THE 1946 AND 1947 LAND TENURE WORKSHOPS

MAX MYERS

South Dakota State College

THE Land Tenure Workshops have sometimes been called an experiment in the application of the workshop technique to agricultural economics. If that is true, then this member of the panel can be considered to have served as one of the experimental animals in the experiment, and one which survived three years of the experiment without contracting anything more fatal or serious than an enthusiasm for workshops.

My mission here is to describe briefly the 1946 and 1947 Land Tenure Workshops. These will be discussed in that order and each will be treated under three topics, namely: Planning and preparation, actual conduct of the workshop, and lessons learned.

1946 Land Tenure Workshop

Planning and Preparation: In the thoughts of the planning group which set up this full-scale land tenure workshop was the purpose to help those working in land tenure research to do a better job. It was decided to hold the meeting of such research workers at a place where interruptions would be at a minimum and where close personal relationships could be developed. It was felt that the group should be limited in size to permit free discussion. Invitations were sent to directors of experiment stations to name or suggest research workers from their states. The actual administrative work of obtaining the personnel and of making the arrangements for the camp were handled by the Farm Foundation.

Actual Conduct of the Workshop: Twenty participants representing 12 States, the Bureau of Agricultural Economics, and Farm Foundation, met August 12-24, 1946, at Deer Path Camp, Land O'Lakes, Wisconsin. Some participants brought members of their families so the total group numbered 51 people. They lived in cabins, ate at the camp dining room, and shared the northwoods recreational opportunities.

Sessions were held daily from 8:30 A.M. to 12:30 P.M. Committee meetings and discussions of individual projects were carried on during afternoons and evenings. The schedule for the morning sessions included:

Historical Developments of Land Tenure Research	4 hours
Theory of Research	8 hours
Research in Farm Tenancy	12 hours
Research in Farm Ownership	12 hours
Collective Tenure	4 hours
Report on South Central Regional Project	4 hours
Committee Reports and Summary	4 hours

The workshop proceeded on an informal basis. Leaders chosen prior to the meeting had made preparations and were responsible for carrying the program along but the program was flexible and the desires of the group directed the discussions. The chairmanship and committee assignments were so allocated and rotated as to encourage participation by all. Of the 20 participants 10 led discussions, 10 served as chairmen of meetings and 14 served as leaders or secretaries on subcommittees. Varying methods and approaches were used by the different leaders. Bulletins were analyzed, project statements scrutinized, current projects reported, procedures outlined, bibliographies distributed and information exchanged.

Problems arising at the meeting caused the appointment of three subcommittees to consider, respectively, (1) the field of land tenure research, (2) criteria to use in analysis of land tenure research, and (3) additional information on land tenure needed in the U S census. A fourth subcommittee was appointed to appraise the 1946 workshop and formulate suggestions for a 1947 session.

Lessons Learned at the 1946 Workshop: The participants agreed without exception that the workshop was very worthwhile and that another should be held in 1947. It was felt that the choice of a rather isolated location where the workers and their families were thrown together to permit a good deal of informal discussion and thinking about land tenure research had been justified. Criticisms of the workshop seemed to center about the need for more practical application of the theory of inquiry which had been discussed. It was suggested that time might be devoted to subcommittee preparation of actual project statements or plans of work.

1947 Land Tenure Workshop

Planning and Preparation: The report of the evaluation committee at the 1946 workshop laid the groundwork for the action of a planning committee which in the autumn of 1946 started preparation for the next workshop. Several rather informal committee meetings were held to develop suggestions for presentation to the

North Central Regional Land Tenure Committee which again decided to sponsor the workshop. Copies of the 1946 report were sent to the directors of agricultural experiment stations who were asked to make suggestions for participants to attend in 1947. An agenda was developed based on the suggestions from the participants in the 1946 workshop. Farm Foundation again handled the physical arrangements of selecting a location and sending out invitations to participants. Those selected as discussion leaders sent material and suggestions to the participants before the meeting.

Actual Conduct of the 1947 Workshop: This workshop was held August 11-23, 1947, at Holiday House, Eldon, Missouri. There were 21 participants who represented 15 states, B.A.E., and the Farm Foundation. This group and members of their families occupied cottages and rooms in the lodge, and ate in a common dining room, overlooking Lake of the Ozarks.

The meeting procedure followed was similar to that of the year before with meetings in the morning and committee sessions and informal discussions mixed with recreation in the afternoons. The agenda for the formal sessions included the following

Scope and Content of Land Tenure Research	4 hours
The Theory of Research in Land Tenure, including methodology criteria for evaluation of methodology analysis of completed projects, and procedure in development of a new project	16 hours
Tenure Problems Ahead	4 hours
Practical Application in Subcommittees of Method previously discussed	12 hours
Philosophy and Purpose of Regional Land Tenure Research	4 hours
Implementation of Research Findings	4 hours
Evaluation of the Workshop	4 hours

As at the previous workshop informality was stressed. In order to encourage participation in discussions each member was assigned several positions. A total of 8 men led discussions, 11 served as session chairmen. In addition the entire group was five times divided into three or four working subcommittees making a total of 18 subcommittees so that each participant had numerous opportunities to work and express himself. This effort was sufficiently successful that it was frequently difficult to distinguish the discussion leaders from the others at any given session.

In addition to the regular meetings one evening was devoted to a presentation, the F.A.O. study on land tenure in foreign countries. One afternoon was spent visiting farms which were being improved

under the Missouri Extension Service Balanced Farming Program. Finally a great deal of the value of the workshop came from the conferences and interviews which went on whenever the regular sessions were not in progress.

Lessons Learned at the 1947 Workshop: There was general agreement that the 1947 workshop was even more successful than the very worthwhile 1946 meeting. The improvement was attributed to a somewhat more logical sequence of discussions, to an agenda which carried the group farther into research procedure, and to the use of subcommittees to attempt practical application of theoretical method. However, the principal criticism was that there had been too many subcommittee assignments, and too many extra sessions in order to prepare subcommittee reports.

This group which recognized unanimously the value of the Land Tenure workshops and felt that there had been an improvement between the 1946 and 1947 versions recommended that another be held in August 1948, preferably in the Rocky Mountain area, and that the major subject matter emphasis be placed on practical application of methods of collecting and processing evidence.

THE 1948 LAND TENURE WORKSHOP

MAX M. THARP

Bureau of Agricultural Economics

THE 1948 workshop was attended by 30 social scientists. They included chiefly land economists, farm-management specialists, and sociologists. The majority of the participants were research workers actively engaged in specific research studies; a few were research administrators. These workers came from 23 States, the Department of Agriculture, and the Farm Foundation. Including their families, about 70 persons were present at the workshop, and in addition several visitors participated in special aspects of the endeavor.

In many respects the program was similar to those of previous workshops. Four hours each morning were allotted to intensive work in committee sessions. The afternoons were given over to daily meetings of discussion leaders, small group conferences, individual study, some committee work, field trips, and private consultations. Two evening meetings were held to discuss two experiments in farm land tenure—the Iowa State College Agricultural Foundation farms and the Bluebonnet farms of Texas, which were recently assigned to the State Agricultural College.

The twelve 4-hour morning sessions (Sunday was not included) were utilized as follows.

Introductions and general organization	1 hour
Current research studies in land tenure	1 hour
Theory of inquiry and research methods	6 hours
Criteria for evaluating research projects	5 hours
Preparation, reporting and discussion of work outlines on 5 subjects	31 hours
Special questions on method	2 hours
Evaluation of the 1948 workshop	2 hours

The 5 subject-matter outlines, which formed the core of the 1948 workshop, were concerned with: (1) public lands, (2) land ownership, (3) landlord-tenant relations, (4) national policy, and (5) legal aspects of tenure. The last subject was added when it was found that a larger number would attend the workshop than was originally anticipated. This addition was necessary to prevent the working committees from becoming too large.

The basic plan of the 1948 workshop was to lay out in logical

sequence a part of the theory of inquiry and to present ideas as to applicable research methods and techniques. Working in small groups, these ideas were applied conceptually to 5 crucial tenure problems in the development of a work outline. The processes followed and the problems encountered in the development of the work outlines were then reported to the entire workshop. The group as a whole offered advice and guidance in adjusting, amplifying, and reexploring the theoretical concepts involved in the processes of formulating the 5 work outlines.

Emphasis was placed upon the thought processes involved in the use of available descriptive information in the presentation of the general problematic situations out of which arise specific tenure problems; in isolating and formulating specifically the crucial problems involved; in developing hypothetical solutions to the problems so defined, in selecting evidence needed to test the hypothetical solutions; in gathering and processing the evidence; and in reporting and implementing the findings. These steps guided the conceptual analysis, but it was found impossible to complete in final form each phase of the job in respective order. Problems were redefined as new light was shed on the situation when committees were working on the hypotheses and considering the evidence needed. The hypotheses were restated as possible solutions fell under the scrutiny of the evidence likely to be found. The process was one of going back and forth all along the line to reshape, adjust, amplify, clarify, delete, or add when necessary as the conceptual analysis proceeded toward the possible assumed findings. As the work outline progressed, it was found necessary to stop frequently to state a presupposition—something assumed by the researcher—and to indicate what items needed to be held constant.

The 1948 workshop was built upon experience and knowledge gained at previous meetings. It was similar to former workshops in that the theory of inquiry and the consideration of criteria previously discussed were used and carried a step further. Small working groups endeavored to apply these ideas to the development of specific work outlines. It was dissimilar to previous workshops in that considerable thought was given to project selection and development of criteria to guide this job; bulletins were not reviewed and evaluated as had been done in the past in an endeavor to shed light on research methods; greater emphasis was placed upon the selection, assembling, and processing of evidence; and

more time was available to consider the processes followed in the conceptual application of theory to specific land tenure problems.

Some of the items stressed at the 1948 workshop that deal with research methods and techniques may be summarized briefly as follows:

(1) There is a vast difference between a project statement prepared for administrative purposes and a work outline or plan of work prepared to guide the researcher as he goes about his undertaking. In the workshop, it was the latter that received primary consideration.

(2) A complete conceptual analysis is necessary before the major evidence needed in the study is determined upon and its assembly undertaken.

(3) The conceptual analysis should follow a logical step-by-step process from a description of the problematic situation through isolation of the problem, formulation of hypotheses, selection and assembly of evidence, analysis of the data uncovered down to and including the reporting and implementing of the findings.

(4) Throughout this conceptual analysis it is necessary to do a sort of spiral or circular thinking, a going back and forth from step to step, always progressing upward, continually redefining, reshaping, and improving the analysis as the thought process leads to a better conceptualization of the whole research undertaking.

(5) It is impossible to attain perfection or to follow rigidly a preconceived sequence of steps. Research methods can never become cut and dried, nor can they be developed into a formula that can be handed to an inexperienced worker to be followed without deviation and further thought.

(6) One primary aim is to segregate the strategic relevant factors into a particularized situation. The work of the researcher is well along when the problem has been isolated and completely defined. As a rule he needs to refine, reduce, and confine the problem in order to present clearly the crucial issues, in other words, he needs to pin-point the problem, then put it under the mental microscope to examine minutely its various parts. This process is essential to the formulation of well-grounded hypotheses.

(7) Selection of relevant evidence is comparatively easy when the problem is carefully defined and clear-cut hypothetical resolutions are determined. Research in social sciences cannot depend upon a poorly formulated problem and hard work to guide purposeful

social action or to push out into new frontiers of knowledge. The researcher cannot let the facts speak for themselves. They never do this; they always speak for or against something.

(8) The research worker needs to keep clearly before him all basic assumptions or presuppositions upon which his study is predicated. He has the responsibility of stating clearly all such presuppositions as well as the factors held constant in reporting his findings.

(9) A rigid, logical, conceptual analysis will reduce costs of research significantly and will improve its quality immeasurably.

(10) Research findings in land tenure can be fully tested only in the field of actual experience. This must be recognized, for social scientists cannot control all of the factors that impinge upon a given situation as can physical scientists.

Final answers as to how a workshop on research methods should be conducted are not known. However, it is possible to generalize tentatively from past experience and some of the ideas may be of value to anyone planning a research workshop. The following items appear to be the more pertinent:

(1) All available techniques should be used to obtain maximum participation by each and every participant. Some procedures that have been used and found helpful are: (a) self introduction, (b) a brief report on the individual's own research or that of the state or agency he represents, (c) frequent rotation of chairmanship and secretaryship, (d) constant endeavor to maintain a workshop, not a classroom atmosphere, (e) elimination of any distinction between discussion leaders and other participants, (f) frequent separation into small working groups of 5 or 6, (g) assembly around a table that will facilitate discussion, (h) meals in a common dining room as near as possible, in family fashion, (i) use of first name or nickname to help along the idea of informality and (j) means of securing punctuality.

(2) Be careful not to overorganize the workshop—keep it flexible, adjustable, and simple; evaluate the process from day to day and from year to year; set up guide posts but do not establish a guard rail.

(3) Do not plan extensive preparation by the participants but select leaders who will be prepared to perform the duties required of them; keep to a minimum the materials sent out to participants, and send them before the meeting date.

(4) Isolate the workshop insofar as possible from outside in-

fluences such as telephones, radios, newspapers, and other professional activities. Isolation depends chiefly upon selection of a meeting place well away from urban influences. An ample assembly and recreation hall is to be desired, and separate space for each major committee is necessary. Housing should expedite rather than make difficult interfamily association.

(5) Try to center activities on constructing or building—on doing or applying techniques to practical situations. Have no formal papers or presentations, no student-teacher relationships. Try to get everyone to participate on an equal basis.

(6) In the construction or work activity stress thought processes, ideas, and conceptualization rather than specific end products. The objective should be to affect the way in which people do things and how they think together, not to stress the completion of a work outline on a given subject or some other specific task. A research workshop should be concerned primarily with methods and techniques rather than with subject matter. Research methods, not land tenure, were stressed at the workshop. However, constant vigilance was necessary to keep illustrations in the field of land tenure rather than engineering or the physical sciences.

(7) Participants should be chiefly active research workers, including those in graduate training. It is desirable also to have present a few administrators and others who have special qualifications or interests.

Many problems have not yet been solved. Perfection has not been attained—far from it. It is recognized that the job will never be completed, for when growth and change stop, stagnation and decay set in. This should not happen. We are convinced that many minds, working from many angles, are essential if we are to make the progress desired in our social science research. This progress can be expedited by constant interchange of ideas and by working and thinking together. Progress has been made, but only the first lap of the journey has been completed.

THE 1948 FARM MANAGEMENT WORKSHOP

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Michigan State College

THE first workshop in farm management research methods was held this year. The suggestion for holding a workshop was made by the farm records subcommittee of the North Central Farm Management Research Committee. It was the opinion of this subcommittee that since most states in the region were doing considerable work with farm records, it would be a good idea to get together for a review and study of research methods being used. The plans for the workshop, as developed, however, were broadened and more than farm records were included in the agenda.

The farm management workshop had three major sections. The *first* of these was a summary of recent farm management research in the North Central States, with a review of the research methods used. The *second* section was on the theory of research and the scientific development of research projects in farm management, with an analysis of two published bulletins considered from the standpoint of the research procedure discussed. The *third* part of the workshop was the actual development of a research project outline on a subject of interest to those in attendance.

Two days were devoted to the first section of the program. During this time a report was made showing recent research projects by states in the region, classified by topics, the same as in the Social Science Research Council, Bulletin 52. This report also showed for each of the projects the source of data, the amount of time being spent on it, date started, date of completion and project leaders. Also presented at this time was a bibliography of farm management publications by states in the region up to the present time, along with a listing of current research projects. The review of methodology used in recent farm management research covered (a) the general method followed, (b) the organization of the project, (c) method of analysis, (d) statistical techniques used, (e) trends in research procedure, and (f) criteria for determining methodology. The evaluating committee of the workshop was of the opinion that this part of the agenda served the very useful purpose of informing the group of the work being done in the region, and laying the ground work for the program that was to follow.

The next two days were spent on the theory of research and re-

lated questions. Several publications on the subject were referred to, among which were "Logic, the Theory of Inquiry," by John Dewey, "A Critical Review of Research in Land Economics," by Leonard A. Salter, Jr. and "An Approach to Research Methodology in Agricultural Economics," by K H. Parsons. The importance of developing one or more hypotheses in the solution of research problems was stressed. The error of generalizing from limited facts or relationships was pointed out. The importance of knowing the nature of the population, the representativeness of the sample, and the probability of the same results being obtained in a second study were emphasized. Statistical techniques can contribute to more sound analysis of relationships that frequently has been done in the past. Many farm management problems, however, are complicated interrelationships, the solution of which is beyond statistical procedures now developed. The evaluating committee felt that this section was very valuable and deserved more time.

After two days on theory, the next two were spent in a critical analysis of a bulletin on "Farm Practices" and one on, "Factor Analysis." The workshop group was divided into two or three subgroups for consideration of the bulletins, then reports were made to the entire committee. The major questions raised on the two publications were: was there a statement of purpose or objectives of the study, were there general or specific hypotheses stated or implied, what assumptions were made, was the sample such that the results could be duplicated, was the method of analysis used statistically sound, and were the conclusions drawn warranted from the data? The evaluating committee was of the opinion that we probably went into too much detail and spent more time on this part of the program than should have been. One day spent in a general analysis of a bulletin, however, would be a fruitful experience.

Most of the next five days were devoted to the actual working out of a hypothetical research project outline on a farm management aspect of soil conservation. The first phase of this activity was *planning the project*. This took one day. After much discussion two general hypotheses were selected. Then we carefully described the conditions or assumptions under which the study was to be made.

The second phase of this part of the program was a consideration of the information needed to test the hypotheses. The questions of not only what information was needed, but where and how could

it be obtained, were discussed. Could experimental data be used? Could information from farm records be applied? How about surveys or case studies of carefully selected farms? Did budget analysis have something to offer in testing the hypotheses? These questions caused lively discussion.

The next phase of the job was analyzing the evidence. Experience in this aspect of research was obtained by each of the four subgroups taking two sets of data which were supplied, and for each one, setting forth the hypotheses, the assumptions, and the suggested method of analyzing the data. This was followed by a discussion by Paul Homeyer, from the Ames Statistical Laboratory, and Earl Heady, who had prepared the example sets of data. There was considerable discussion of statistical techniques, the place of statistics in such analysis, and the desirability of farm management men working with statisticians and research workers in other departments on related problems.

Formulating the conclusions was the last phase of this activity. It was pointed out that the data may (a) prove the hypothesis, (b) disprove it, or (c) prove that a different hypothesis is needed. The subgroup took a Minnesota bulletin and from data presented in three tables tested the conclusions presented or tried to develop new conclusions. In the discussion following the report by the subgroups, Paul Homeyer, the consulting statistician, stressed the difficulty of isolating the influence of one factor from data of the kind frequently used. He thinks it would be worthwhile to assume data and try to work out theoretical solutions. The above concluded the agenda of the workshop except for the report of the evaluating committee and two or three meetings on regional research projects being submitted for consideration as Hope-Flannagan projects. The two being developed were: "Economic Aspects of Farm Mechanization in the Midwest," and "Economic Aspects of Soil Conservation in the Midwest."

Perhaps some of the comments, questions and suggestions of the evaluating committee on the workshop might be of interest to this group. In regard to a general evaluation of the workshop as a whole, the committee felt that without question this workshop was very profitable to the participants. After our experiences there in the two weeks, during which time most of us gave more thought to research methods than in a long time, we are of the opinion that all of us will be more critical of our own methodology and will give

careful consideration to new research projects. This workshop provided a wonderful opportunity to discuss our problems and was a very fruitful experience. We recommend that there be a second farm management workshop next year, and the experiment station directors have approved the idea.

In regard to the next workshop, the committee suggested that it be held at a resort, institution, hotel or other isolated meeting place, with meetings scheduled four hours in the morning and the afternoon left free for informal conferences and study. The bringing of families is to be optional. In view of the wide variation in the share of the participant's expenses paid by the different institutions, and the attitude of some directors that workshops are vacations, it behooves us to point out that ours is a relatively new field with greater need for development of research methodology than many of the long established departments. If some of the directors continue to feel that the workshop, as now conducted, is not sufficiently full-time business, then I think it would be wise to change the plans slightly, if necessary, to increase the moral and financial support by our directors, and in the meantime do our best to sell them on the great benefit derived by the participants, and their departments from the workshops. Personally, I feel that the two weeks spent at the workshop probably will improve the farm management research at Michigan State College more than anything I have done recently

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ROUNDTABLE ON OPERATION OF THE RESEARCH AND MARKETING ACT OF 1946

Chairman: Noble Clark, University of Wisconsin

ADMINISTRATIVE PROBLEMS AND POLICIES OF THE RESEARCH AND MARKETING ACT OF 1946*

HARRY C. TRELOGAN
Research and Marketing Act

THE leading administrative problem posed by the Research and Marketing Act just a little over a year ago was one of launching a large, new research and service program for agriculture under somewhat adverse conditions—not the least of which was the fact that the Act had been passed fully a year earlier and had received well over a year of advance billing. Considerable effort had been made to plan a program during the year that intervened between the passage of the Act and the first appropriation for it. These efforts were severely handicapped by uncertainty with respect to when and how much money would be available. This particular handicap was aggravated by the fact that an appropriation was not passed until a month had elapsed in the fiscal year in which the program was to be initiated. Prior to that time no tangible program could be arranged, no commitments could be made, and no obligations could be incurred. Nevertheless, a sufficiently definitive program had been mapped out both within the Department of Agriculture and by the state experiment stations with respect to Title I, Section 9 of the Act to permit the beginning of actual research and service work within a matter of weeks after the appropriation became available.

All of this advance work had to be accomplished with voluntary assistance from advisory groups and with borrowed part-time help to serve as an administrative staff. This staff had to be almost completely reconstituted and enlarged when the program was activated and definite assignments could be made. One result of the long advance notice of the forthcoming program was a large accumulation of ideas for work and of project proposals that sought

* A paper presented before the Annual Meeting of the American Farm Economic Association at Green Lake, Wisconsin, September 14, 1948.

financing. It presented at once a tremendous task of selection of work and allocation of funds. Most of the proposals presented were originated by persons or agencies acting independently or giving relatively little thought to the prerogatives or interests or responsibilities of other agencies which were expected to participate in the funds. There was, therefore, little that could be identified as an over-all program or plan other than the Act itself. A difficult problem of integration or coordination immediately confronted the Administrators, especially in view of the fact that the Act emphasized the need for such coordination and integration. An approach to the solution of this problem was to assign definite coordinating responsibilities to established agencies within the Department of Agriculture. The policy has been, for example, to refer to the Bureau of Agricultural Economics every project proposal involving economic research for review from the standpoint of coordination with other economic work.

Many of the proposals received for consideration contemplated the expenditure of large amounts of funds. Persons presenting the proposals were evidently encouraged to think in terms of large programs of activity by the authorized appropriations that appeared in the Act which amounted to over sixty million dollars a year in the course of five years. This large figure left an impression on persons planning research which has proved to be unwarranted in the light of the differences that are appearing between authorizations for appropriations and actual appropriations of funds.

Under these conditions the work was launched just a little more than a year ago. Many improvisations were resorted to in the interest of getting effective work under way promptly. Numerous mistakes naturally resulted, but none of them has proved to be of a serious character, and they appear to have been out-weighed by the gains made in getting productive work started with widespread participation along the courses intended by the legislation. Because of the attention that had to be paid to promptness in initiating the program in the short time available, numerous problems have been only partially solved or remain for further attention.

At the moment, as we enter the second year of active work under the Research and Marketing Act, the one problem about which all others tend to center is the fact that the demands for work are far greater than can be financed or adequately staffed. In fact, there aren't sufficient resources available at this time to undertake the

research and service proposals that have been classified as urgent by advisory committees, legislative committees, and research agencies. As the actual appropriations for the Act are below the authorizations for appropriations, the problem of selection is made considerably greater than it might otherwise be because plans continue to be made and presented on the basis of authorizations. Consequently, one of the continuing difficult administrative problems is that of selecting and curtailing the work to fit the pattern of the actual appropriations.

An important aspect to this problem is that of dispelling ideas that are abroad to the effect that there is a vast fund available to be tapped if one just manages to get a project on paper in the proper technical form and present it to the proper place or to the right people. The point has to be made that the preparation of a project meeting all technical requirements pertaining to form and content represents only the first and perhaps the easiest step in getting work approved under the Act.

Problems arising from limitations of funds available may be broken down into two parts. One involves efforts to acquire more funds, and the other involves efforts to make the most efficient use of the available money. In general, the policy thus far has been to pay more attention to the second of these alternatives on the theory that a good record of performance would be most effective in attracting more adequate appropriations. Nevertheless, considerable administrative time must be devoted to the preparation of budgets and presentations of needs for funds to the budgetary agencies of the Government and the appropriate legislative committees of the Congress.

New Problems

Beyond these problems of a general nature, there are several more specific items that merit attention in a discussion of this sort. It must be recognized that the Act presents several new and unique administrative problems. These have to do with such items as advisory committees, contractual research, and regional research which are provided in this Act for the first time.

Each of these items might be regarded as part of the larger proposition that the Congress has in the Research and Marketing Act of 1946 left more latitude for administrative decision in the allotment of funds than has heretofore been true with respect to ap-

appropriations for agricultural research and service work. Actually under this Act only a relatively small portion of the funds is distributed by formula to specified agencies. Virtually all of the funds so distributed are provided for in Title I, Section 9, specifically in Sections 9(b)1 and 9(b) (2) of the Act, which pertains to State Agricultural Experiment Stations. The remainder may be allotted administratively under several sections of the Act, each of which has different purposes and limitations and, indeed, separate appropriations.

An observation meriting reiteration at this point is that the Research and Marketing Act of 1946 is a complex Act comprised of several parts that have to be treated as separate entities. These parts (see Sections 9, 10(a) and 10(b) of Title I and Title II in its entirety) evidently had their origin in different bills that had been presented to Congress and were either incorporated in the Act or were withdrawn in favor of the Act. In the administration of the Act it is necessary to keep these parts distinct and also to distinguish between work conducted with funds provided by the Act and work conducted with funds from other appropriations. There is a constant problem of acquainting applicants for funds with the limitations involved and of properly classifying project proposals.

A natural result of the complexity of the Act is variation in emphasis placed upon different types of work encompassed by the Act. Along with this is a variation in interpretation of what is involved in different types of work. Definitions pertaining to utilization, marketing, and regional work are left largely to administrative rather than legal decision. Many of these have to be arbitrarily established, taking into account the relationships between parts of the Act and legislative history. A reasonable balance between commodities, between natural and social sciences, and other classifications must be maintained.

Advisory Committees

Considerable reliance is placed upon advisory committees in obtaining recommendations that will aid in arriving at decisions on these points and also in the selection of work to be undertaken. The provision for advisory committees in Title III of the Act is unique in agricultural legislation. Consequently, much interest is evidenced in how they operate.

The National Advisory Committee, which is specifically required

by the Act, is comprised of 11 members, 6 of whom represent farmers or farmer organizations. This committee, which meets quarterly and does not have any alternate members, devotes its time to consideration of general policies pertaining to the Act. A comprehensive statement of the policies it has recommended was issued through the facilities of the Department of Agriculture on April 22, 1948. This statement makes clear the type of problems which occupy the attention of the Committee.

One of the first recommendations presented by the National Advisory Committee was that commodity and functional advisory committees should be established to make recommendations relevant to specific fields of work to be conducted under the Act. Accordingly, 22 such advisory committees have been established, 19 of which cover commodity fields, and 3 non-commodity or functional fields, such as transportation, cold storage, and foreign trade. With few minor exceptions each of these committees is constituted in the same manner as the National Advisory Committee—that is, with 11 members, no alternates, with 6 members representing farmers or farmer organizations.

Some difficulty has been encountered in establishing the functions of these committees and all of them have not operated in the same way. The foremost problem has been to define the advisory function of the committees as distinguished from the function of making administrative decisions. In general, this problem has been satisfactorily settled, and the committees have devoted their attention to the recommendation of problems meriting favorable consideration for research and service work. To perform this function, the committees have had to make comprehensive reviews of the problems confronting producers and distributors of the agricultural commodities with which they were concerned and rate these problems in the order of their importance. They have been assisted in this review work by counter-part groups appointed within the Department of Agriculture called working groups. The working groups are comprised of representatives from each agency of the Department concerned with the type of work being considered by the committee. For example, the Dairy Working Group, which works with the Dairy Advisory Committee, includes a representative from each agency which deals with problems of production and distribution of dairy products. In every instance, the working group prepared for the benefit of the advisory committee a com-

prehensive report outlining the potential problems that might merit consideration for research and service work. The advisory committees have, in general, reviewed these reports and made their recommendations to the Administrator of the Act, listing the major problems with some indication of their classification in terms of importance and type with respect to their relationship to production or marketing. A continuing problem confronting these committees is one of becoming thoroughly acquainted with the research work that has been and is being done in their respective fields with funds other than the Research and Marketing Act funds by both public and private agencies.

In most instances, the advisory committees have recommended publication and distribution of the reports prepared by the working groups. In all instances recommendations prepared by the advisory committees have been distributed to interested agencies. While it is recognized that the recommendations presented to the Administrator by these advisory committees do not impose obligations on the Department or other research or service agencies to perform the work, it is felt that these recommendations may be distinctly beneficial to all agencies concerned with the planning of research and service work. These recommendations receive serious consideration when projects are initiated and prepared by many agencies, especially the Federal research bureaus, and the Administrators of the Act take them into account when they make selections for the allotment of funds.

Contracts

Another new feature of the Act is the provision whereby the Secretary of Agriculture may contract for research and service work with agencies outside the Department of Agriculture. This permits wider participation in the Act and enables the Department to tap research and service resources that it cannot itself provide. The policy has been to use contracts where they will make it possible to use personnel and facilities that cannot be readily duplicated and thereby increase the tempo of work. Contracting has to be done in accordance with the terms of the Act which require that the work be performed more effectively and more rapidly or at less cost than if performed by the Department of Agriculture. Experience thus far has indicated that the problem of contracting for research work within the confines of governmental

regulations is extremely difficult. Measurement of performance of research, for example, is nebulous compared with the measurement of production of tangible items or performance of services for which most Government contracts are let. This provision for contracting research, however, is regarded by the Administrators as very desirable and one that must be guarded so that the privilege will not be jeopardized.

Regional Research

The provisions for cooperative regional research under Title I, Section 9b3 is another entirely new development in terms of Federal legislation, even though the regional approach to many problems has been applied in the past by groups of States and Federal agencies concerned with a common problem.

Development of policies related to the regional research program has been delegated for the most part to the Committee of Nine specified in the Act to represent State Agricultural Experiment Stations. The Committee of Nine has leaned heavily upon the regional organizations of Experiment Station Directors for assistance in planning and directing the program of work which it has recommended to the Secretary of Agriculture for approval. Without going into detail, it appears that the Committee of Nine has encountered formidable problems similar to those encountered with the Act as a whole. Foremost among these has been the problem of selection because far more work has been proposed than could possibly be financed. The first step toward a solution of this problem involves determination of projects that may be regarded as regional in character. Closely allied problems have been those of coordination and integration as well as the achievement of some reasonable balance between types of work and between States within the regional program. There is also a problem, that has yet to be completely resolved, of coordinating regional research with other research conducted by agencies acting independently. In some respects the latter problem is more apparent than real because of the broad titles placed on research projects. A characteristic action of the part of research workers generally is to utilize broad titles and objectives to avoid confinement of their activities by narrowing the scope of projects. The practice leads to serious misunderstanding and misinterpretation on the part of reviewers, especially fiscal agents, legislators and administrators, who detect

in the titles repeated instances of apparent overlapping and duplication.

A real measure of progress toward coordination of Federal and State research has been afforded by the regional program. This has been expedited through widespread participation in the regional conferences by appropriate representatives of State and Federal agencies. Equally as much progress has probably been gained toward coordination of work between State Experiment Stations as a result of these conferences. The Office of Experiment Stations has been instrumental in facilitating the arrangement of these conferences and the exchange of information between State and Federal research workers.

State Departments of Agriculture and Bureaus of Markets

The Research and Marketing Act provides for the first time opportunities for Federal financing of work by State Departments of Agriculture or Bureaus of Markets. Two problems have been outstanding in this phase of the program. One has to do with the delineation of work conducted by these agencies and by State Agricultural Experiment Stations, and State Extension Services. With wide variation in individual State Laws and in the work proposals submitted it has been difficult to stake out or identify a field of work for their participation that is generally applicable. Briefly, the policy has been to approve service projects that do not involve enforcement of State regulatory laws and that are mutually agreeable with the other State agencies.

The second problem has been to achieve some sort of equity in the distribution of funds between States. This particular problem is complicated by the matching requirements of the Act, differences in ability of States to provide matching funds, as well as qualified personnel and facilities, and by uncertainty regarding Federal appropriations for the Act. The latter problem is a grievous one in view of the fact that State Legislatures usually meet bi-annually and Federal appropriations have not been definitely known before the beginning of each fiscal year.

Extension Services

By comparison, the problem of arranging a workable program with State Extension Services under the Research and Marketing Act has been easy by virtue of the long record of cooperation be-

tween the State and Federal Services. Problems of matching and of distinguishing between the work conducted with RMA funds and with "regular" funds have nevertheless been just as important.

Experiment Stations

The nature and extent of State Agricultural Experiment Station participation in the Title II program remains as an outstanding unsolved problem. While some Title II projects have been started with several States, the arrangements for and the amount of such work have not been satisfactory to either the Experiment Stations or the Administrator of the Act.

Efforts are now being made to delve into this problem and try to find mutually agreeable policies and procedures that will facilitate more such work. Further coordination of Federal and State work undertaken with funds from other parts of the Act will also receive additional attention in the coming year.

Current Problems

This discussion does not permit more than a partial listing of problems and only hasty mention of those that are included. A few problems of a more current nature might be worth mentioning before closing the discussion. With the beginning of a new fiscal year with the funds available, it has been necessary to establish some policies with respect to old and new projects. The policy has been to give priority to a continuation of projects started in the preceding year before undertaking new projects. It was felt that the investment already made in incomplete work should not be lost simply to start different work unless the new work was of an emergency character. This particular policy is less important in its application to Title II which received a more liberal appropriation. It is quite important, however, with respect to the other sections of the Act where the relatively smaller increases in appropriations have tended to cause some curtailment rather than permit expansion of work. This is true because the money available for the last fiscal year was utilized during only a portion of the year. The expenditures were being made at an accelerating rate as the year progressed. Consequently, the new appropriations were hardly enough to sustain the rate of expenditures incurred during the last quarter of the year. Added to this has been the problem of providing for some work that was classified by Con-

gressional Committees, advisory committees, and others as urgent. This has necessitated a definite cutback in some of the work that was started, but in no instance thus far has incompleted work been entirely stopped.

Congress has, through the channels of budgetary hearings, resolutions, and other means, conveyed to the Administrator of the Research and Marketing Act the idea that an expansion of work dealing with costs and margins involved in marketing agricultural products is expected. In part, the more liberal appropriations for Title II may be regarded as a reflection of this attitude. A problem consequently arises in obtaining the proper emphasis on this type of work. There are wide differences of opinion regarding what constitutes acceptable projects in this field, as well as a reluctance to tackle the work in view of the limited number of qualified personnel and the lack of sympathetic cooperation available for such work.

One approach to the encouragement of more effective marketing research and service work has been the initiation of a training program intended to provide more qualified personnel in the future. This program consists of several parts to do with in-service training in the Department of Agriculture, encouragement of summer school courses in the State Agricultural Colleges, and efforts to obtain greater emphasis on marketing courses in the future. These activities are being organized with committees appointed through the good offices of the Land-Grant College Association, and it is hoped that they will yield beneficial results before very long.

In the meantime, the problem of meeting the demand for additional or more effective marketing work presents a challenge that will tax the imagination and ingenuity of agricultural workers generally. It must be regarded as an obligation to be accepted under the Research and Marketing Act. It is an obligation that must be shared by Federal and State agencies, by natural scientists and social scientists, and by educational and service workers. Agricultural economists have a real part to play in this endeavor. Although the responsibility is not theirs alone, they should have a contribution to make in whatever capacity they may be serving whether it be college professor, public or private research or service worker, or participant in the marketing system. A sound constructive program will depend much upon their initiative and performance.

OPERATION OF THE RESEARCH AND MARKETING ACT OF 1946. STATE AND FEDERAL RELATIONS*

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THE Agricultural Research and Marketing Act of 1946, frequently referred to as the Hope-Flannagan Act, authorizes a significant expansion of traditional types of agricultural research and specifies new emphases and closer relations with farm, trade, and industry groups. The large fund authorizations in the act, the variety of types of research and marketing work covered, the new emphases specified, and the new forms of administrative organization necessary and implied have caused both widespread interest and confusion among agricultural research workers.

The act is divided into three major titles, the first of which lists a great variety of types of research to be encouraged and supported. A total of \$41,000,000 is authorized in Title I, of which \$20,000,000 is included in Section 9 to be allocated to the states, and \$21,000,000 in Section 10, of which \$15,000,000 is for "utilization" research (Section 10-a) to be conducted by Department of Agriculture laboratories and \$6,000,000 (Section 10-b) for cooperative research with state agricultural experiment stations and other appropriate agencies.

Ninety-seven percent of the sums authorized for Section 9 are to be allocated to the states and territories, and the remaining three percent are available to the Office of Experiment Stations of the U. S. Department of Agriculture for administrative expense. Of the ninety-seven percent, twenty percent are allotted equally to each state and territory, not less than fifty-two percent allotted half on the basis of rural population and half on the basis of farm population of each state, and not more than twenty-five percent for cooperative research in which two or more state agricultural experiment stations cooperate to solve problems that concern the agriculture of more than one state. This regional research fund is to be used only for cooperative regional projects recommended by a committee of nine persons elected by and representing the directors of the state agricultural experiment stations, and approved by the Secretary of Agriculture or his authorized representative.

* Paper presented at the annual Meeting of the American Farm Economics Association, Green Lake, Wisconsin, September 14, 1948.

Administration of Title I Funds

Two very significant points should be noted regarding Section 9 of Title I: first, a very definite formula is set up for distribution of funds appropriated so that each state gets a specific amount as determined by the formula; second, that the words "not more than twenty-five percent" are used in the case of funds to be available for cooperative regional projects, whereas the words "not less than fifty-two percent" are used in the case of the funds to be allocated to the states on the basis of their rural and farm population. The formula allocation removes any possibility of political manipulation, or any similar activities in influencing the amounts each state receives. This policy is in keeping with past legislation for agricultural research. This is not the case with Section 10 of Title I or of Title II funds.

The emphasis upon regional research is generally considered to be desirable, although the fact that not more than a fourth of the appropriations may be used for this purpose indicates regional projects should not constitute a major use of Section 9 funds. In other words, it is assumed that most research done under Section 9 will be done on a state basis, and that best results can be expected by this procedure. A great many regional projects have been proposed, and many of them are now in operation. Much travel has been involved by federal and state staff members in planning and executing these projects. Too frequently available funds have been divided equally among the states involved, so that the sums are too small for effective operation. Much criticism and confusion has developed over the regional projects, and the feeling persists that the growth of regional projects should be much more gradual than has been the case with the sudden large expansion accompanying availability of Hope-Flannagan funds. Many feel it would have been wiser to have started with fewer regional projects and with less than the maximum of twenty-five percent of the Title I funds.

The committee of nine should meet with Research and Marketing Administration staff members regularly to discuss procedures and policy on regional projects. A two-day or one-day meeting, semi-annually, with the entire RMA staff or those most informed and concerned, should be helpful in improving the efficiency of regional projects through reduction of excessive travel and numerous federal agency representatives attending regional project meetings, and more effective planning of projects and assignment of respon-

sibility for their execution. The development of a handbook of procedure, establishment of types of projects considered most desirable and appropriate, and a better understanding of the functions and services of federal agency staffs for cooperative work with state staffs should do much to reduce the present major criticisms of regional projects, namely, (1) excessive travel, (2) minute division of funds, and (3) lack of adequate planning and resulting general ineffectiveness.

The only provisions for allocation of Section 10-a funds contained in the act are that the "utilization" research contemplated is to be conducted "so far as practicable" at laboratories of the Department of Agriculture, although provision is made for contracting with public or private organizations or individuals. Nearly two-thirds of Section 10-a funds have been allocated to the Bureau of Agricultural and Industrial Chemistry. In the case of Section 10-b funds for cooperative research with state agricultural experiment stations and other appropriate agencies, the Bureau of Plant Industry, Soils, and Agricultural Engineering has secured the largest allocation. However, there is no formula or any other specific directives for allocation of Section 10-a and 10-b funds. Final authority rests with the Secretary of Agriculture.

The last section of Title I (Section 11) provides that not less than twenty percent of the funds allocated to the states in Section 9 shall be used by state agricultural experiment stations for conducting marketing research projects. It should be noted that the wording is "not less than twenty percent" and indicates that the Congress intended that more emphasis be placed on marketing research by state experiment stations. In many cases, the impression seems to persist that not more than twenty percent of the funds appropriated will be utilized for marketing research, but it should not be forgotten that Congress intended this to be a minimum and not a maximum.

The total funds authorized under Title I are \$41,000,000 annually, at the end of five years of operations. This is slightly over twice the amounts authorized in Title II. The research contemplated under Title I covers the whole range of problems in agriculture and related fields, and implies analyzing whatever leads the research may uncover, whether in the field of production, marketing, or general policy. The distribution of funds to the states in Section 9 (approximately half the total of \$41 millions) is specifically by

formula; a minimum percentage of one-fifth must be used for marketing research, and not to exceed a fourth may be used for regional projects. Thus, major allocation policy is specifically stated in the act and relationships between federal agencies and state experiment stations are generally satisfactory so far as Section 9 funds are concerned.

Title II Funds

The provisions of Title II are such as to make administration of this part of the act and the resulting relationships between state and federal agencies quite different from those of Title I. In the first place, there is no specific formula for the distribution of funds. Second, the emphasis in Title II is on marketing. In fact, Title II is cited as the "Agricultural Marketing Act of 1946". Third, all three phases of marketing work are emphasized, namely, research, education (demonstrational), and service (information, inspection, and regulatory), but no indication is given of the relative emphasis to be placed upon each phase. \$20,000,000 are authorized to be appropriated in Title II, and in Sections 10-a and 10-b of Title I (utilization research in connection with development and application of present, new, and extended uses) there are authorizations for a total of \$21,000,000 or a combined total of \$41,000,000 for research and other activities pertaining to marketing and to new and extended uses of agricultural products. This compares with only \$20,000,000 authorized in Section 9 of Title I to cover the very extended array of problems enumerated in the policy statement.

Even agricultural economists are inclined to admit that this is placing heavy emphasis upon marketing and new and extended uses. All of us know that more efficient marketing will not in itself make the difference between 4-cent hogs and 30-cent hogs, or between 35-cent and \$2.00 wheat, or between 5-cent and 20-cent cotton. These prices have occurred under marketing procedures that were essentially identical. The level of industrial employment may be far more important in determining the level of hog prices than methods or organization of the marketing machinery, and prices of cotton and wheat may be influenced far more by national and international trade policies than the specific method used in selling or distributing these products. It is, therefore, of paramount importance that in the interpretation of what constitutes marketing work the projects be broadly conceived and that the

opportunities made available for agricultural and social progress by this act not be lost because of undue emphasis or preoccupation with a single phase of the agricultural problem or even a single phase of the marketing work.

In discussing the act with administrators and staff members of twenty selected land-grant institutions recently, the author found fairly general agreement that there were advantages in not having all authorized funds in Title II allocated by formula to the states or other agencies. Title II constitutes a liquid or flexible fund which should make it possible to allocate considerable sums from time to time, regardless of where such ideas or problems originate so that more complete or effective work can be done in meeting acute problems or unusual and serious difficulties that may arise in agriculture over the years. However, because a specific formula for the allocation of Title II funds is not provided in the act, it becomes imperative that a rather well understood and clearly conceived policy for the administration of Title II funds be worked out, and that as soon as possible.

Basic Principles for Administering Title II Funds

Several basic principles may be advanced for such a specific policy. *First*, a clearly defined policy of about how much of Title II funds are to be used for research, how much for educational and demonstrational work, and how much for informational, inspection, and regulatory work (service) must be developed. The Research and Marketing Administration, with the approval of the Secretary, obviously has final say in deciding this. It would seem that such a policy could best be worked out by a committee which would represent state and federal agencies engaged in these three types of marketing work. The proportions decided upon for each of the three types of work should not be rigid from year to year but sufficiently flexible to permit emphasizing types of marketing work most needed at different times. However, a minimum proportion should definitely be set aside for research as a regular policy, because research is the foundation for effective functioning of the other two phases.

For the fiscal year 1948 approximately seventy per cent of Title II funds were allocated to the Extension Service and the Production and Marketing Administration, including state departments of agriculture and markets. These two agencies are concerned

primarily with marketing educational and demonstrational work, and market information, inspection, and regulatory work, respectively. Many feel this amount is too large for these types of work; some may feel that the proportion is about right; others may feel that a much larger portion should have been allocated for research, divided into three groups federal bureaus and agencies, private individuals or agencies, and state experiment stations. The fact remains that the act carries no statement indicating the relative emphasis to be placed upon the three phases of marketing work, and policies on this aspect should be established at an early date.

It is apparent that it was the evident desire of the framers of the legislation that the research should lead to a heavier reliance upon private enterprise in solving agricultural problems and less dependence upon action programs, government sponsored, financed and administered. If this be true, the act perhaps does not give sufficient emphasis to research on the broad fundamental problems which relate to the economic and social aspects of various agricultural industries. The emphasis is preponderantly on marketing work and on new uses of products, and implies that an increase in marketing efficiency, together with the development of new uses will largely solve agriculture's most pressing problems.

Second, the Department of Agriculture should have a strong research program, and a considerable portion of the funds appropriated under Title II should be reserved to or made available to Department agencies to attack certain problems which are nationwide in scope or in which the states are unable or unwilling to make the most effective contribution. A strong federal research program is also desirable to give leadership on national issues which states individually cannot give, and to work out more effective cooperative relationships in certain types of research with state experiment stations, including regional research projects. Sweeping reductions of appropriations for federal bureaus by Congress do not contribute toward the building of a competent federal research program. Appropriations for such federal program should not be considered competitive with state programs, but complementary. If all workers in land-grant institutions and state experiment stations were more thoroughly convinced and active in this regard, agricultural research, particularly agricultural economic research, would be more effective today.

Perhaps a third of Title II funds allocated for research should

be made available to Department of Agriculture agencies for research contemplated in this part of the act. Such allocations should not be considered as replacements for the usual congressional appropriations made directly for operation of Agricultural Department agencies. The existing lack of a coordinated administrative organization for research work of the U. S. Department of Agriculture has contributed to the current tendency to use Title II funds as replacements for funds eliminated in the usual congressional appropriations for particular bureaus. The Agricultural Research Administration has largely coordinated the research work of the Department of Agriculture involved in animal and plant science work, human nutrition, and agricultural engineering. However, research work involving economic and social problems of agriculture, including marketing, is now undertaken by at least four bureaus or agencies within the Department—the Bureau of Agricultural Economics, the Office of Foreign Agricultural Relations, the Production and Marketing Administration, and the Farm Credit Administration. Establishment of a research division in the Department of Agriculture to administer all agricultural research, under the direction of an individual with under-secretary rank, might help reduce the confusion and increase efficiency. Such coordination might also help to utilize more effectively the Title II funds.

A *third* principle which should be considered carefully in the establishment of a specific policy or procedure for the utilization of Title II funds is that research which is to be undertaken by federal agencies or bureaus should be done by those whose primary responsibilities, interests, and staff training are in research, both pure and applied. The fact that considerable Title II funds for research have been allocated to agencies in the Department of Agriculture which are relatively new in the field of research, or whose major responsibilities are not research, has caused a great many of the state as well as many of the federal people to feel that the results achieved will not be significant. This has been an important factor in the confused relationships that now exist between the experiment stations and the Research and Marketing Administration regarding Title II funds. It should be pointed out in passing that it would be unwise to exclude completely an agency which is primarily a regulatory or enforcement agency from undertaking or cooperating in any research.

Federal bureaus or agencies undertaking a regular research program should secure a major portion of their research funds directly from congressional appropriations, as in the past. The Research and Marketing Administration has followed this plan and has generally approved allocations for regular federal research agencies only for a new type of work or work which would otherwise not be done through regular congressional appropriations. This is a sound policy. The replacement of regular appropriations by Congress in any wholesale fashion by administrative allocation from Title II funds would be a very dangerous policy, with serious implications for our democratic form of government as well as for effective research work.

A *fourth* important principle that should be kept in mind in the establishment of policies and procedures for handling Title II funds used for research is that a significant portion of such funds should be used for contracts or grants such as are provided for or at least implied in section 205 of the act. This section provides that the Secretary of Agriculture shall have authority to enter into contracts and agreements under terms of regulations promulgated by him with states and agencies of states, private firms, institutions, and individuals, for the purpose of conducting research and service work, when in his judgement these can be performed or carried on more effectively, more rapidly, or at less cost than if performed by the Department of Agriculture. Such contracts may be made for work to be performed within a period of not more than four years from date of the contract, and there are no requirements for matching such funds.

The use of the contract or grant principle which has been effective in the case of many foundation grants would do much to encourage individualized research, and the development of research ideas and proposed projects from every possible source. Obviously all of the individuals who are competent or who should be encouraged to undertake research in the marketing of agricultural products are not now or will not be employed by the Department of Agriculture or the state experiment stations. Unless the grant principle is established as a definite policy in the administration of Title II funds, much of the possible effectiveness of the act will be lost. Personalized research has established itself over the years as a very effective means of efficient use of research funds, and this important aspect of agricultural research should not be

overlooked. Perhaps a research committee of seven, consisting of three representatives of the Research and Marketing Administration, one representative from the Office of Experiment Stations, one representative from the Agricultural Research Administration, one from the Bureau of Agricultural Economics, and one other individual might set up the procedures for administering this grant program. A strong educational program through the professional journals, over the radio, in pamphlets, and other means would help to call attention to the availability of funds and the possibility of grants for individuals or any groups or agencies that have worthwhile ideas for useful research projects.

The agricultural experiment stations have established a fine reputation in the field of agricultural research. Although there are certain types of problems upon which other research agencies or individuals can do more effective work, research on many agricultural problems, particularly those which concern a given area or product within a state or within a portion of the nation, will probably be done most effectively by the state experiment stations. Although Title II does not specifically designate any amounts of funds appropriated under this title for the state experiment stations and does not give any special preference to state experiment stations, nevertheless the state experiment stations will undoubtedly play a very important role in the carrying out of the objectives of Title II. Title II states that "maximum use shall be made of existing research facilities owned or controlled by the Federal Government or by state agricultural experiment stations. . . ." Also, Title II provides that "to the maximum extent practicable, marketing research work done hereunder in cooperation with the states shall be done in cooperation with the state agricultural experiment stations. . . ." It would seem apparent from the above wording of the act that Congress intended that experiment stations should share significantly in the use of Title II research funds. Some have suggested that Title II research funds might be divided into three equal parts, a third to federal agencies, a third for grants to individuals, private institutions or agencies, etc., and a third for state experiment station projects.

Regardless of the amounts which may be designated for experiment station projects, a well-thought-out procedure for handling such projects must be developed. Misunderstandings have arisen through the fact that projects submitted by experiment stations

have been referred by the RMA for technical advice or recommendations to federal agencies or groups not engaged primarily in research or whose major concern is other than research. The Research and Marketing Administration has the responsibility with the Secretary's approval to set up in consultation with the experiment stations a procedure which will be satisfactory to both groups and facilitate effective research by the experiment stations. Obviously, the Office of Experiment Stations can be helpful as a general liaison agency, but it is not the one to make the decision on allocations. Such procedure would change the whole function of the Office of Experiment Stations and its relations with the states. The Committee on Organization and Policy of the Experiment Stations is perhaps the group through which the RMA could work in trying to develop a handbook of procedure concerning Title II funds used for marketing research. A joint committee, comprising RMA staff members and members representing the experiment stations, with perhaps a total committee of five to seven members, should work out such a handbook.

A *fifth* principle which should be included in the establishment of policy in handling Title II research funds is that the matching provision with the state experiment stations, provided in section 204-b of the act, should be administered with flexibility. This matching provision is already proving embarrassing to some states, and with increased appropriations that will likely be made available in the years ahead for carrying out the provisions of Title II, this matching provision may be even more embarrassing in the very states or areas where marketing research is needed most or could be done most effectively. State experiment stations should, of course, try to secure appropriations for matching funds, and in many cases they probably will, but in the absence of matching funds the state or the institution should not be penalized. Each project should be considered on its own merits, and if the project is particularly meritorious, the absence of matching funds should not be a determining factor. Section 205 specifically implies that there should be flexibility in carrying out the matching principle by providing for contracts and agreements with the states with no matching requirements.

A *sixth* and final principle that should be kept in mind in allocating Title II funds is the very great importance of keeping the three phases of marketing work provided for in Title II (research,

education, and service) in proper balance. A careful study of Title II indicates that this was undoubtedly the intention of Congress. However, there has been no official announcement of such a policy. In fact, Department officials do not seem to be agreed on the types of work to be emphasized with Title II funds. The provision in Title III of the act to bring farm groups, trade groups, and industry representatives into a more intimate advisory relationship with the Department of Agriculture than in the past should not be confused as implying that major emphasis in Title II is to be upon marketing service work. The author can find no evidence in Title II of any congressional intentions to emphasize any one of the three phases of marketing work to the exclusion or reduction of the other.

Experience during the past century has clearly established the great contribution which research and education have made to our progress. This is not to minimize the importance of informational, inspection, regulatory, or similar marketing service work, but to dispel any notions that Title II funds were meant to be used principally for marketing service work. Research and education have significant roles to play, and if the funds allocated for research are not divided up into small, ineffective amounts on a shotgun basis but used to attack a few of the more significant marketing problems, research will prove once again that it is the foundation for an effective educational and service program.

Title III

Title III provides that in order to implement the marketing research, education, and service work authorized under Titles I and II and to assist in obtaining fullest cooperation among federal and state agencies, producers, farm organizations, and private industry in the development of and carrying out of such research, education, and service programs, the Secretary of Agriculture shall establish a national advisory committee of eleven members, six of whom shall be representatives of producers or their organizations. The Committee must meet at least once each quarter. This establishment of a federal advisory committee, designed to bring farm groups, trade groups, and industry representatives into a more intimate advisory relationship with agricultural research and service work of federal and state agencies, is highly desirable. However, the functions of the committee should be specifically advisory.

Title III also provides for establishing other appropriate com-

mittees, including representatives of producers, industry, government, and science. Nineteen commodity committees have been appointed, and this would seem to be far too many for effective operations. It is recommended that the number of commodity committees be reduced materially or eliminated entirely. If commodity committees are deemed desirable, they should be organized on rather broad commodity group lines, such as fruits and vegetables, dairy and poultry products, etc., rather than on the present very narrow basis. The trend should be definitely more in the direction of problem, or functional, committees such as foreign trade, transportation, cold storage, and the like.

Conclusion

There should be prepared as quickly as possible a simple handbook on procedure, covering Title II, together with a statement of policy regarding the relative emphasis to be placed upon the three phases of marketing work. This should be made available to all state and federal agencies undertaking marketing work and to all other interested individuals or agencies. The division of the Research and Marketing Administration staff into three sections—research, education, and service—to pass upon proposals and requests for funds for each of these types of work promptly and intelligently, once major policies are established and the handbook of procedure has been prepared, would improve federal-state relations and should improve administrative effectiveness.

The Research and Marketing Administration is the agency in the Department of Agriculture whose primary responsibility is not the conduct of agricultural research, but the encouragement and support of agricultural research through making funds available either through contracts, grants, or matching provisions. Also, the RMA has responsibility for encouraging and supporting educational and service work in marketing. The over-all objective is to develop a "sound, efficient system for distributing and marketing agricultural products which is so essential to a prosperous agriculture". All publicity released by the Research and Marketing Administration should give full credit to the agencies, individuals, or corporations performing the research, educational, or service work, and merely indicate that such work was done with the assistance of funds made available through the Research and Marketing Act. Obviously, to carry out properly its functions as an efficient financing

branch of the Department, the Research and Marketing Administration must be staffed with individuals who are familiar with and have attained some standing and proficiency in agricultural research and the marketing field, if they are to pass upon proposals and requests for funds promptly and wisely.

The problems encountered in developing more satisfactory federal-state relations in carrying out provisions of the Research and Marketing Act indicate decisively that there is a very real need for setting up more clearly established channels of information and understanding between the states and the Department of Agriculture, and for a more complete and continuous use of such channels. Major decisions of policy and procedure obviously, to be most effective, will be arrived at jointly by representatives of both the states and federal agencies. Above all, the decisions which are made should keep firmly in mind the achievements and promise of decentralized research on agricultural problems which has helped to bring American agriculture to a high level of efficiency and prosperity. In this program, the state experiment stations and extension services, and particularly the departments of agricultural economics, must play an important role.

DISCUSSION*

F. L. THOMSEN

Production and Marketing Administration

Dr. Renne evidently has given a great deal of thought to the many administrative problems involved in Federal-State relations under the Research and Marketing Act. For the sake of brevity I will confine my comments to those features of his excellent paper with which I am in disagreement.

I get the impression that Dr. Renne, despite his background in agricultural economics, believes too much emphasis has been placed on marketing work, both in the Act itself and in the administration of the Act. I know that many of the State college administrative officials with whom he has discussed the matter in recent months also feel, probably much more strongly than Dr. Renne, that this tendency to overemphasize marketing exists in connection with the Act. This feeling apparently is based partly upon the immediate difficulty of obtaining qualified marketing research, extension and service personnel, and partly upon a rather widespread lack of confidence in the potential efficacy of marketing research in helping to solve some of the more important agricultural problems.

* A discussion at the Annual Meeting of the American Farm Economic Association, Green Lake, Wisconsin, September 14, 1948.

I agree that it is not desirable to devote more funds to marketing than can be efficiently utilized over the long run. At the same time, I think that those who sincerely believe in the desirability of more rather than less emphasis on marketing should guard against the possibility of a permanent diversion of Research and Marketing Act funds to nonmarketing work, rationalized on the basis of the present temporary personnel shortage. Perhaps I am too suspicious of the intentions of some administrative officials in regard to support of marketing research. This may stem from my observations of what happened in the case of Purnell funds. Given a free hand, I am sure that many research and extension administrators could find what appears to them to be good use of most of the appropriations under the Act, in doing more of the same kind of things that have been done in the past.

We have heard here this afternoon several references to "overemphasis" of marketing. Personally I fail to see any evidence of such overemphasis. Visiting the campus of an agricultural college, one is directed to the dairy building, or the soils building, or the chemistry building, but never to the marketing building. The marketing man on the staff may be found sharing a room on the third floor of the administration building!

Dr. Renne says that "even agricultural economists are inclined to admit that this is placing heavy emphasis upon marketing and new and extended uses." Again, he hopes that opportunities for other contributions under the Act will "not be lost because of undue emphasis or preoccupation with a single phase of the agricultural problem. . . ." He raises the question as to whether "the Act perhaps does not give sufficient emphasis to research on the broad fundamental problems. . . ." He apparently does not like the fact that "the emphasis is preponderantly on marketing work, and implies that an increase in marketing efficiency . . . will largely solve Agriculture's most pressing problems."

Dr. Renne points out that "all of us know that more efficient marketing will not in itself make the difference between 4-cent hogs and 30-cent hogs, or between 35-cent and \$2.00 wheat, or between 5-cent and 20-cent cotton. These prices have occurred under marketing procedures that were essentially identical."

The implication is that because changes in business conditions or international trade have had more effect on livestock or crop prices than have marketing changes, marketing research will be correspondingly less effective than research in other fields including business conditions or international trade. I am sure that Dr. Renne, on second thought, would draw no such conclusion. Remedies are not necessarily related to causes. A broken leg is treated in the same way whether incurred in an automobile accident or from a slip in the bath tub. And fluctuations should not be confused with levels. Marketing conditions in the past have not fluctuated as much as some other conditions, but this does not imply that we may not contribute as much or more to raising the level of agricultural income through improvements in marketing as by improvements in other conditions which might be the subject of research and service work under the Act.

I am not one of those who look upon marketing as "the agricultural prob-

lem," but I am vigorously opposed to the defeatist attitude which many of our research administrators and even agricultural economists seem to have toward the practical benefits to be derived from marketing research and service work. I believe that any evidence which may appear to support such an attitude reflects the inadequacy of our approach to marketing research and service work.

In my opinion, if we disagree with Congress in its evident intention to place major emphasis on marketing in the work under the Act, and believe that the appropriations should have been authorized for use in developing other types of research, we should take these conclusions to Congress and suggest a revision of the Act. Meanwhile, right or wrong, Congress has directed us to emphasize marketing, and we should make an honest attempt to use the funds for finding major solutions to major marketing problems, rather than to circumvent the intention of Congress by indirection.

Although he has been very diplomatic about it, Dr. Renne has seemed to favor a division of funds which would give the State institutions a more nearly fixed and greater share of them, and fewer restrictions on the way in which college officials might spend these funds. I gathered that he does not fully approve of the degree of flexibility in the administration of the Act which has been given by Congress under Title II. He wants the Administrator of the Research and Marketing Act to issue a policy statement fixing these conditions to a degree which the Congress itself avoided.

Without trying to justify the manner in which the Administrator's staff has handled the job of administering Title II funds under the flexible provisions of the Act, I maintain that we would be reducing potential accomplishments under the Act by eliminating or materially reducing the flexibility under Title II by allocations of funds on a cut and dried basis. We need more rather than less centralized direction of research under the Act, and more rather than less cooperation between Federal and State agencies.

Most important marketing problems are not found within the boundaries of a farm, a local shipping point, a State, or even a region. Marketing research and service work presents a different problem, requiring a quite different approach, from research and extension in agricultural production. The failure to recognize this, and the continued attempts to do marketing work on the same kind of individualized, lone-wolf basis that frequently has characterized production research, is in my opinion a basic reason for the lack of larger accomplishments in the marketing field in past years.

The atomic bomb never could have been consummated successfully by individualized laboratory research, even though much of the latter was a necessary prerequisite. Similarly, the marketing job is big and complex, and its successful conclusion will necessitate large scale thinking and team work. We will never get very far as long as both State and Federal agencies give more attention to jealously guarding their bureaucratic positions than to clearly outlining and attacking the national marketing problems which the Congress directed us to deal with under the Act.

Dr. Renne apparently labors under the erroneous impression that Title II funds going to the Production and Marketing Administration are used mainly for marketing service work. He has used some very diplomatic language in conveying the thought that many State research administrators frown upon substantial allocations of Title II research funds to PMA, and are not eagerly seeking new research relationships with that agency of the Department. The ostensible reason for his attitude seems to be the fact that PMA is engaged primarily in marketing regulatory and service work. Surely, however, this responsibility for regulatory and service work cannot be seriously considered as the true basis for such objections to research by PMA. The Agricultural Research Administration has very extensive responsibilities in the regulatory and service field. A large part of the activity of the Bureau of Agricultural Economics consists of service work closely allied to that done by PMA. The State institutions themselves are engaged in a variety of service and regulatory activities. It is my impression that some people are allowing themselves to be influenced, in their attitudes toward marketing research agencies, by considerations which have nothing to do with marketing research. I am in no sense defending the present organization of marketing research within the Department, but do maintain that in any consideration of the matter we should be governed by needs and potential accomplishments under the Act, not by extraneous considerations.

Dr. Renne suggests elimination or radical reorganization of the industry advisory committees. I also have found many things to disagree with in the advisory committee set-up. At the same time, it would seem that there are certain benefits to be derived from the committees which have been overlooked by Dr. Renne. They are an important factor in public relations, in fostering support for the marketing research program, and in unearthing problems requiring attention. Later, it is to be hoped that they will constitute an important means of getting the end products of the research program into actual application, without which the research itself would be of little value. No doubt some simplification and revision of the advisory committee system is desirable, and I believe that the matter is receiving attention from the Administrator.

DISCUSSION*

H. R. WELLMAN

University of California

It is worth while for research workers to have the opportunity from time to time to view the problems of research through the eyes of the administrators. Such a view might make us somewhat more tolerant of administrators, and possibly enable us to offer some constructive suggestions to administrators.

* A discussion given at the Annual Meeting of the American Farm Economic Association, Green Lake, Wisconsin, September 14, 1948.

Dr. Trelogan has mentioned the more important problems with which he and his colleagues have had to wrestle in launching the ambitious and somewhat novel program of research in marketing under the Research and Marketing Act. He has indicated how they have attempted to meet these problems, and has given us some idea of the degree of success achieved. He readily admits that numerous mistakes have been made, but claims that these "appear to have been outweighed by the gains made in getting productive work started with widespread participation along the courses intended by the legislation." He also points out that "numerous problems have been only partially solved or remain for further attention."

"At the moment . . . the one problem about which all others tend to center," says Dr. Trelogan, "is the fact that the demands for work are far greater than can be financed or adequately staffed." He places considerable stress upon lack of funds. The failure of appropriations to match authorizations has no doubt complicated the administrator's task. Choice among alternatives is seldom easy, and denial of requests is not a good way "to win friends." Nevertheless I am inclined to place less emphasis than Dr. Trelogan does upon lack of funds, and to give somewhat more weight to shortage of qualified personnel.

The supply curve for well-trained research workers is relatively inelastic in the short run. More funds would have increased the demand for research workers in marketing but would not have added much to the current supply of them. The market price for their services might have been pushed up, but not much more research would have been accomplished.

The dangers of having more money to spend on marketing research than there are qualified persons to employ are of two sorts. First, there is the temptation to hire people who are not yet adequately trained; and second, there is the temptation to shift personnel from other fields to marketing. Resort to these expedients would tend to lower the quality of research in marketing, and in the long run would probably do more harm than good.

One of the novel features of the Research and Marketing Act is the wide latitude given to the administrator in the allotment of funds. It is this feature which gives rise to most of the administrative "headaches." Dr. Trelogan points out in making allotments "a reasonable balance between commodities, between natural and social sciences, and other classifications must be maintained." But just what is "a reasonable balance" he very wisely does not say.

Whether administrative allocation of funds will prove to be superior to congressional allocation of funds either by direct appropriation or by formula remains uncertain. Only time will tell. Ten years from now we may have acquired sufficient experience to warrant drawing conclusions, but not now.

Likewise I doubt that sound judgments can yet be made regarding the effectiveness of regional research. If we had to strike a balance sheet today, I suspect that the results secured per dollar of expenditure would not be impressive. Yet regional research has, I think, considerable potentialities. But whether these potentialities can be realized is by no means certain.

While the provision for regional research was designed to reduce duplication of work among states, another provision of the Act is likely to increase duplication of work within the states. Allocation of funds to state departments of agriculture or state bureaus of markets will, I suspect, lead to some overlapping of work done by the experiment stations and extension services. How serious such duplication may become, I have no means of knowing. But it does pose a real problem which could become acute.

And finally may I emphasize the point which Dr. Trelogan made in his closing paragraph. Much hard work remains to be done by all of us before the Research and Marketing Act becomes securely established. It is still on trial.

ROUNDTABLE ON WORLD TRADE

Chairman: Bushrod W. Allin, Bureau of Agricultural Economics

UNITED STATES FOREIGN TRADE POLICY— A PRACTICAL APPROACH*

JOHN W. EVANS

Department of Commerce

MY PRINCIPAL purpose in this paper will be to help you feel something of the impact of the prejudices and aspirations of other countries on our own policy determinations.

I believe it is the failure of the businessman, and often of the economist, to appreciate these practical obstacles that has led to such a wide acceptance of the charge that the United States has no economic foreign policy. If we believe in free enterprise, why do we permit purchasing missions of foreign governments to take business from American private exporters? If we are opposed to the use of quantitative restrictions on trade—of quotas and embargoes—why do we tolerate the barriers that almost all countries have erected today to limit the importation of goods from the dollar areas of the world? If we believe in non-discrimination in trade, why do we admit to our shores the goods of countries that discriminate against our exports?

The impossibility of formulating our own national policies in a vacuum—without regard to world opinion, was revealed in the series of international negotiations that culminated in the Havana Charter for the International Trade Organization, adopted in March of this year by 53 nations, subject to ratification by their congresses and parliaments. The United States provided the initiative for these conferences and prepared the draft upon which all the discussions were based. As might have been expected, the basis of that draft was the traditional American pattern of liberal and non-discriminatory commercial policy, but even in the first draft an effort was made by the United States to inject a note of realism. In spite of the strong hold that private enterprise has on American thinking, there was no effort in the draft to outlaw state trading. The American drafters were content to provide rules which would

* A paper given at the Annual Meeting of the American Farm Economic Association, Green Lake, Wisconsin, September 14, 1948

prevent nations from nullifying, through state trading operations, their basic undertaking to refrain from coercing trade into unnatural and uneconomic channels. Although the drafters transferred to this international arena the traditional American fight against monopolies and cartels, they recognized the necessity for an exception to their own principles and provided for price stabilization agreements among governments. Although they gave powerful expression to the American conviction that quantitative restrictions on trade are more destructive than tariffs, they made provision, at least during the postwar period, for the problems of countries which must ration the use of their scarce supplies of hard currencies.

But the note of realism in the American draft of the Charter was not sufficient to meet the objections of those countries which opposed the American concept of liberal international commercial policy. At Havana the forces of opposition on more than one occasion came close to winning control of the Conference and to writing not a Charter for freer world trade but an international endorsement of permanent and chronic economic warfare.

The source of what is probably the most insistent opposition to the American drive toward a reduction of world trade barriers is the urge for economic development in almost every economically backward country of the world. On the surface, this ambition is understandable enough. If it could be achieved it would mean greater prosperity and higher living standards throughout the world. But what most so-called "backward countries" mean by *economic* development is *industrial* development. And when a country of a few million inhabitants tries to rival the great industrial centers of the United States or Western Europe, its costs are likely to be too high to permit it to compete with the goods of older industrial areas. It must not only reserve its own market for domestic exploitation but must try, through bilateral trading deals or through the creation of preferential trading areas, to obtain a larger protected market for the forced growth of its new industries than its own population can provide. In doing so, it is likely to condemn its people to a lower standard of living even than that which they have enjoyed under a colonial or quasicolonial economy. Yet, the drive to industrialize is insistent throughout the world. The depression of the 1930's taught most raw material producing countries that in the declining phase of the business cycle the goods they sell in world markets fall much more rapidly than the goods they buy. The sec-

ond world war taught them that they cannot depend on foreign sources for even the minimum necessities of modern life. But the impetus to industrialize derives as much from political as economic motives. As colonial areas have gained their political independence they have quite naturally sought to confirm their new status by some practical demonstration of economic independence

The drive toward industrialization begets an immediate hostility toward any proposals for liberalizing world trade. At Havana it provided the unifying force behind an undeveloped country bloc that opposed almost all proposals for restricting the right of member countries to use import quotas or embargoes or to create new preferential systems. And the almost religious fervor that moved the countries making up this bloc enabled them at the same time to outdo the United States in their insistence that existing preferential systems and the use of quantitative trade barriers by the industrialized countries be abolished.

Let me give you an example of the lengths to which the passion for industrialization carried its disciples. The draft Charter, presented to the Havana Conference by the Preparatory Committee, contained a general prohibition against the establishment of any new tariff preferences, though it permitted the organization to grant exceptions, in unusual cases, where such a preference could be justified as essential to an approved program of economic development. At the beginning of the Havana Conference more or less sweeping amendments to this provision were submitted by self-styled undeveloped countries from all over the world. Three Central American countries submitted amendments which would permit any new preferential system between any two or more countries of that region. Other amendments would have permitted any new preferences desired among the countries that formerly made up the Republic of Greater Colombia, that is Venezuela, Colombia, Panama and Ecuador. One of these, an amendment submitted by Ecuador, would also have permitted any new preference between Ecuador and any contiguous country, or between any two contiguous countries in Latin America or between any pair of Latin American countries regardless of location. An amendment submitted by Argentina would have permitted any preferential arrangement between any two contiguous countries, provided one of them was "undeveloped." Several amendments were submitted permitting new preferences among the members of the Arab League or between

members of the former Ottoman Empire. Another amendment, subscribed to by several countries, would have permitted new preferences among the countries of a swollen Middle East, ranging from Greece on the west to Afghanistan on the east. And, finally, an amendment by Burma would have permitted new preferences among any of the countries of South East Asia.

The amendments to which I have just referred had to do with a single article of the Charter. There were amendments as drastic in content and nearly as numerous affecting nearly every substantive article which could in any way have restricted the freedom of action of undeveloped countries to encourage the forced growth of a Birmingham or a Pittsburgh in every desert and on every tropical mountain slope. Special exemptions were demanded from the requirements relating to use of import quotas, the use of protective internal taxes, of price fixing or of state trading, or relating to the negotiation of tariff reductions.

While the desire to industrialize may be the most conspicuous of the forces in opposition to a liberal trade policy, there are many others. But most of them spring from a common emotion; fear of uncertainty. This fear, not limited to undeveloped countries, takes a great variety of forms. There is the fear on the part of raw material producing countries of price demoralization in the event of another world depression. At Havana this fear gave rise to demands that the United States guarantee to the rest of the world that it would not repeat its breadlines of the 1930's. However unrealistic these demands may sound, it would be a mistake to ignore the fact, only too apparent to the rest of the world, that the prosperity of all countries depends on the prosperity and the purchasing power of the United States.

The European countries demanded greater freedom to control their imports, as a necessary aid to reconstruction, than had been provided in the original American draft of the Charter. They cited not only their present shortage of dollars and the necessity for conserving those dollars for the purchase of food and essential capital goods, but also the longer term competitive disadvantages arising from the destruction of their capital plant, the loss of skilled manpower in the war, the liquidation or destruction of income-bearing foreign investments, the growing disadvantage in their terms of trade arising from increasing world agricultural prices and, in general, the dislocation of their economic institutions.

One of the most puzzling manifestations of this sort of fear at Havana was the attitude of the United Kingdom. To an American economist it would seem that the recovery of Britain as a world power is dependent upon a maximum volume of world trade and that a simple will to survive would prompt her to grasp at any opportunity that offered a chance of reducing trade barriers in other countries. But both in the trade agreement negotiations at Geneva and during the Havana Conference it often appeared that the British were willing to sacrifice his one chance rather than give up any of the obviously temporary advantages of the Empire preferential system.

In the field of international investment a basic conflict of objectives within the unindustrialized countries resulted in another source of resistance. Although industrial development would obviously be promoted by the encouragement of foreign investments within their borders, many of these countries strongly resisted any proposals to restrain their freedom of action to discriminate against foreign investments or to confiscate the property of foreign investors. This apparent paradox arises from the fear, sometimes justified by experience, that large foreign commercial or industrial interests exercise an undue influence in the political life of the country in which the investment is located. Attacks on Yankee imperialism make good copy in Latin America and have paid off well in many a political campaign. And no Latin statesman who consults the sub-Rio Grande version of the Gallup Poll would openly advocate the encouragement of foreign investment by the one device most likely to succeed—non-interference. A number of Latin American delegations attempted to solve this problem by proposing that the large, industrialized countries accept an obligation to make public funds available to their more backward brothers.

Those are some of the trials that must be faced by any American economic foreign policy. I have described them not with any pretense that they encompass the entire problem or even that they provide a particularly useful guide. Let us call them a series of random and disorganized laboratory observations.

Any actual analysis of the problem must begin with an assumption as to the objectives we intend to pursue. Here, fortunately, we are on fairly solid ground. I think we can accept as axiomatic that the objective of foreign policy—both political and economic—

is security. The only differences of opinion lie in how we translate "security." To many it will be synonymous with peace, and to these, peace itself will appear to be the ultimate objective. But the security objective of every administration in our history has encompassed two aims: peace if possible, but strength in the event of war. Thus, while promoting and supporting a United Nations to prevent war we actively prepare for the next war, though we hope it will not come. There have often been wide differences of view as to which of these twin aims should predominate at any point in time. But complete reliance on one alone has been limited to a handful of extremists in either camp.

The first dilemma of our economic foreign policy, then, lies in this dualism. Economic policies aimed at promoting and preserving peace may sometimes weaken our own strength in the event of war, and economic policies or programs aimed either at a direct addition to our wartime strength or at supporting the political objective of strengthening our potential allies will frequently run counter to those policies best designed to avoid international friction leading to war.

While this dilemma is real enough when we must choose between certain alternative economic measures, there is a general course of policy that can, at least theoretically, promote both objectives at the same time. And it happens that this is the course that has been followed throughout our history—a course that is entirely consistent with the basic philosophy that has characterized American economic life from the beginning. In internal affairs it is seen in the constitutional provision against trade barriers between the states and in our anti-trust laws. On the international front it is seen in the constitutional prohibition against export taxes, in our adherence to a single column tariff, in our traditional friendliness toward the investment of foreign capital within our borders and, at least during the twentieth century, in the adherence of both political parties to the principle of unconditional most favored nation treatment for all countries. This basic policy may be briefly summed up as the promotion of freedom of initiative in trade and investment, with a minimum of artificial restraint.

This liberal tradition has served the country well. And because it is deeply rooted in American thinking, any discussion of what our policy should be must begin with it as a starting point. Will it serve as a foundation upon which a more detailed structure of

economic strategy for the future can be built, or has it outworn its usefulness?

Any foreign policy, to survive, must meet three tests. It must be designed to achieve an objective that corresponds with the real interests of the citizens it is intended to serve. It must be understandable to those citizens and consistent with their established traditions. And it must have a reasonable chance of acceptance by the outside world if it depends on the cooperation of other countries for its success.

The liberal policy meets the first of these two tests surprisingly well. It does seem to offer a means of reconciling the apparently conflicting sides of our basic security objective. It fits our need for national economic strength even better than when it guided the founding fathers. If a large volume of trade contributed to the growth and prosperity of the United States in the nineteenth century, it has become essential to us in the twentieth. We have emerged from two world wars as the world's only great creditor nation. At the same time, the vast natural resources upon which our growth was largely based, have suffered serious depletion. Furthermore, the rate at which we can exploit those resources has been overtaken and exceeded by the tremendous growth in our plant for processing materials into goods for consumption or for defense. While trade barriers in general reduce the volume of trade, discriminatory trade barriers can lead to the total destruction of most trade in the long run. The essence of trade is specialization. And the bilateral balancing of trade—frequently the motive and always the effect of discrimination—drastically limits the field of specialization. The policy of non-discriminatory, multilateral, trade, with a general lowering of tariffs, provides a practical compass direction for achieving the objective of American economic strength.

The same policy should be equally well adapted to the aim of promoting peace. It is no longer possible to attribute all wars to economic motives, but it is safe for us to accept the view that economic rivalries do provide powerful incentives for dispute. If all trade barriers around the world were removed, there would be no need to fight wars to obtain access to markets or raw materials. And even if the world were only to abandon the discriminatory use of barriers to trade and investment there would be fewer opportunities for international political friction. If unrestrained trade has added to the prosperity of each of the American states, it should

contribute to the prosperity of nations. And if we accept the thesis that more prosperous neighbors are more friendly neighbors, a liberal trade policy should increase our chances of avoiding wars in the future.

I believe I have already demonstrated that a policy based upon non-discrimination and upon opposition to quantitative restrictions on trade is consistent with some of the most firmly rooted of American traditions. I will spare you a further elaboration of the point that it is the *only* policy that is consistent with our belief in private enterprise. Up to this point it seems safe to say that the liberal foreign trade policy meets the second test—that of acceptability to the American people. The only source of doubt is the question of public attitude toward a policy of reducing tariff levels in international negotiation. The Reciprocal Trade Agreements Act has a much shorter history than the other elements that make up the broader policy we have been discussing. But even here the evidence is of overwhelming public support. Shortly before the expiration of the Act this year, for example, a Gallup Poll showed 83% of informed voters favoring extension.

There remains the third test of policy. Has it sufficient foreign acceptance to hold out a reasonable chance of success? From the analysis at the beginning of this paper, it may seem to you that the United States stands at one pole, with all the rest of the world at the other, and that nothing but the blindest optimism could justify our continuing to pursue a course of liberal trade. Let me sum up the brighter side of the picture.

In the first place, very little that happened at Havana indicated any great philosophical gulf between the United States and the other countries at the Conference. With very few exceptions the delegations present indicated their fundamental belief in the maintenance of free enterprise and of the conduct of trade on the basis of freedom of choice. The amendments they proposed usually took the form of specific exceptions to meet their real or fancied problems rather than a denial of the basic philosophy behind the original American proposals. In fact, other countries sometimes stood on the side of *simon-pure* liberalism against the United States, as when they attacked, with some unanimity, the provisions which would permit the United States to continue its agricultural subsidies. On the other hand, some of the exceptions to pure liberalism, proposed by other countries, turned out upon examination to be in

the interests of the United States. For example, some relaxation of the restrictions governing the use of customs unions appeared essential if the purposes of the Marshall Plan in strengthening Western Europe were to be fully realized. Most important of all, the opposition to the United States proposals was never unanimous on any point. When the devastated countries strove to open a breach in the basic principles, they found themselves opposed by the small countries, and when wide open exceptions were proposed for the benefit of the undeveloped countries, Canada, the European countries, and frequently the southern British Dominions rallied to the defense of liberalism.

But the final proof that the United States is not out of step with the rest of the world lies in the document that was finally approved by the representatives of 53 countries at Havana. This Charter made concessions, it is true. Some exceptions were broadened. An entire chapter relating to economic development took the place of a few brief articles in the original American draft. But in spite of these changes the basic principles remain almost intact.

The undertaking to lower trade barriers is still there in the obligation imposed on all members to negotiate with each other for the reduction of tariffs and for the elimination of other charges imposed on imports. The basic rule against discrimination remains, and the only permissible exceptions are those which derive either from demonstrated balance of payment difficulties or from a demonstrated need in connection with an approved program of economic development. The rules which govern state trading operations are more complete and stronger than those in the original American draft. The obligations of governments with respect to restrictive business practices—while not quite so rigid as in our first proposals—go far beyond any previous agreement in the internationalization of our anti-trust policies. Intergovernmental cartels, in the form of commodity agreements, are placed under the control and supervision of an international organization for the first time in history.

The conscientious student of the Charter for the International Trade Organization will find many points at which he disagrees with the final text. Some of the exceptions to the rules will be deemed unnecessary. But he must inevitably conclude that the Charter does provide for the first time a mechanism whereby international economic disputes may be ironed out, and that the Charter represents the first effort to provide any international restraints on many

of the practices of governments which have been most disastrous to maximum trade and to peaceful political relations

The contents of the Charter for the ITO are likely to be discussed a good deal during the next six months, as it must be submitted to Congress for ratification. Every economist will want to study its provisions and reach his own conclusion as to whether, taken as a whole, it forms a reasonable basis for the conduct of our international economic relations. You will want to compare its rules, including the exceptions to those rules, with what we would have in the absence of its adoption. Some of the obligations it would create among its members approximate or duplicate obligations now existing in bilateral agreements or treaties with some countries. Many others represent a first try at international convention and international cooperation in fields which have hitherto been left entirely to the determination of each country. While I do not want to reach your conclusions for you, I do urge that you compare the Charter not with an imaginary ideal but rather with the existing body of international rules and obligations. Those of you who have the time and patience will also find it worth while to study the text of the Charter drawn up at Havana with the 600 or more amendments which were submitted at the beginning of that Conference.

As of possible help to you in your study of the Charter, I want to point out one more feature of its provisions—what might be termed its automatic safety valve. I have heard claims that the basic principles of the Charter have been destroyed by the exceptions and escapes which it contains. Put still more harshly, the claim has been made that the Charter is honeycombed with exceptions which are available to every country except the United States. Now, there are basically only two major types of exceptions to such fundamental principles as that of non-discrimination and the prohibition against quantitative restrictions. One of these has to do with the need for economic development of backward countries. The exceptions of this type are in every case permitted only under the close supervision of the International Trade Organization and, usually, only with the prior approval of the Organization or based upon a finding of fact by the Organization. Unless a majority of the members of the Organization should be completely cynical, this safeguard should prevent these exceptions from becoming a rule. The other class of exceptions are those permitted to countries in balance of payments difficulties. In this case the right to use the exception

must be based upon findings by the International Monetary Fund. But let us suppose that all the other countries of the world are able to establish the fact that their reserves of gold or hard currencies are dangerously low and thereby be entitled to recourse to these exceptions. That would come fairly close to being the situation today if the Charter had now been ratified by the requisite number of countries and the Organization had come into existence. Under these circumstances it is true that many of the advantages which should accrue to our export trade under the terms of the Charter and under the tariff concessions that we received in the related General Agreement on Tariffs and Trade could be nullified while the exports of the other member countries to the United States would enjoy the full benefits of the Charter with very few exceptions.

On the face of it this may appear inequitable. But every economist knows that the limitation on our total exports today lies in the world's ability to earn or borrow dollars and not upon the restrictions imposed by any one country. The crying need at this time is for an increase in our imports. For our exports as a whole no present stimulation is needed, though there are many individual instances in which we will want to oppose discrimination against American goods in order to preserve our markets for the future. Some day the present imbalance will be corrected. Our exports to the world will have fallen or our imports will have increased to the point where it is economically desirable for us to obtain a lowering of world barriers to our exports in general. At that time most countries will have escaped from their balance of payments difficulties, and, under the terms of the Charter, they will no longer be entitled to these exceptions, and our exports will begin to receive the full benefit of the Charter provisions and of the tariff concessions which we have negotiated. Thus, the exceptions in the Charter will, if properly drawn, operate to restore and maintain an over-all balance of trade and payments throughout the world.

So far, my analysis seems to be approaching the conclusion that the most realistic economic foreign policy for us to adopt is the one that is now being followed by the United States Government, and that the most concrete exposition of that policy is to be found in the ITO Charter. That is, frankly, what I believe. But the analysis omits certain important phases of our economic policy that must be considered. It does not necessarily take into account the fact

that economic policy must serve the political policy being pursued at any given time. Obviously the most important phase of our international political policy at the moment is the effort to strengthen and restore the countries of Western Europe and the territory of the former enemy states now occupied by us or our Western allies. The strengthening of Western Europe requires not only financial aid but also sympathetic assistance to the efforts of these countries to get back on their own feet. Many of our judgments must be qualified by this shorter term but pressing necessity. Our attitude toward the establishment of customs unions must be modified so as to encourage the closest possible cooperation among the countries of Western Europe. We cannot permit our attitude toward the use of quantitative restrictions to prevent such bilateral trading agreements among those countries as may create beneficial trade that would not take place in the absence of such agreements. Coming closer to home, we must balance the need for maintaining and military strength against the objective of strengthening Europe and other friendly countries. This last point will launch me on my only excursion into the unpopular subject of export controls. If it were possible to view our future security entirely in terms of the strength of the United States within its continental limits, it would make sense for us to prohibit the exportation of all those capital items that would serve any purpose in building our industrial capacity. But if we want strong allies the export of a few thousand tons of steel, of machine tools or even of food may add much more to our global strength than if they were consumed in the United States.

I have named only some examples of the special problems that arise if our economic policy is to be coordinated with our political policy. But I hope they are enough to show that a too academic approach to our basic policy of liberalism in world trade and our basic purpose of maintaining maximum strength within our own borders must be qualified. With this in mind, I think you will find that many of the provisions in the ITO Charter are more realistic, from the point of view of the United States, than they may appear at first glance. And I hope you will find that the administration of our export controls, though such controls by their very nature involve injustices and inconsistencies, at least indicates an effort at realism.

I am afraid that all that I have said will sound like an apologia

for the entire present course of United States policy. It has not been so intended. Many mistakes have undoubtedly been made. I know of some and have played my share in making those mistakes. My main thesis is that, in spite of the calamity howlers, the world has not so changed as to make our old gods impotent. So long as we approach them with a touch of realism they should still serve us well. I have tried hard to conjure up better or more practical ones but have not been able to find them.

DISCUSSION

DON S. ANDERSON

Production and Marketing Administration

Recently the paper reported that the Secretary of Commerce had secured a twelve per cent reduction in the allocation of wheat for export that had been recommended by the Secretary of Agriculture. These same papers implied that this was a victory for the Secretary of Commerce over the Secretary of Agriculture. Perhaps this should anger me and cause me to find much fault with Mr. Evans' paper, since he is a part of the Department of Commerce.

But I find it hard to be angry. Old things are comforting, and last evening it was pleasant to encounter old things—it was comforting to find that agricultural economists—at least some of those on last evening's program—were still concerned with an old worry of theirs—agricultural pressure groups. This afternoon we have another old friend—foreign trade—and in the main those agricultural economists—who through the years have argued that much of our agricultural production must be gotten rid of in foreign lands if we are to be prosperous should find little to disturb them in Mr. Evans' paper. For Mr. Evans makes reference to a similar circumstance when he says "there are many individual instances in which we will want to oppose discrimination against American goods in order to preserve our markets for the future." Certainly the phrase "to preserve our markets for the future" suggests that some one feels that some time it will be necessary to get rid of some of our production in foreign lands if we are to be well off.

Now this, of course, has nothing to do with pressure groups or with the twelve percent reduction in the wheat export allocation. This reduction will make more wheat available for the United States housewife. The fact that with a fixed amount of money available to ECA the less money spent on agricultural products the more will be available for industrial products is entirely incidental. Last evening's discussion seemed to indicate that all of the pressure groups are on the side of increasing exports of farm products.

But there are one or two sentences in Mr. Evans' paper that do raise the question of pressure groups—to which reference was made last evening. It reads, "While the desire to industrialize may be the most conspicuous of the forces in opposition to a liberal trade policy, there are many

others." Reference is made to "the desire" but we are given no hint of who has or holds this "desire." If the "desire" exists in a democracy, who could hold it and make it felt other than a group? But perhaps it would be a pressure group only if the "desire" was one of which we did not approve. If on the other hand the "desire" was one held to be worthy, the group would just be nice people interested in the "general welfare."

There is another sentence even more suggestive of group action. It reads, "This apparent paradox arises from the fear, sometimes justified by experience, that large foreign commercial or industrial interests exercise an undue influence in the political life of the country in which the investment is located." Obviously the topic assigned to Mr. Evans did not require that he comment on the possibility of large commercial or industrial interests exercising undue influence when they are located not in foreign lands but in the land of the owner of the investment.

But there are other parts of the paper that could have been elaborated on to the benefit of those who are here to hear it. It is stated that "we can accept as axiomatic that the objective of foreign policy—both political and economic—is security." It is stated further that "the security of every administration in our history has encompassed two aims: peace if possible, but strength in the event of war." With this most people will probably agree, for most of us want peace so badly that we are willing to go to war if that is necessary to preserve the peace.

The bothersome sentence in the discussion of this conflict between what is necessary to preserve the peace and what is necessary for strength in war reads, "Economic policies aimed at promoting and preserving peace may sometimes weaken our own strength in event of war."

Why should this be so? For example, it is pointed out that, "the vast natural resources upon which our growth was largely based, have suffered serious depletion." Our strength in war should then be strengthened by large imports of materials free from import duties. Should such imports interfere with the keeping of the peace? Do we now have restrictions of our own that interfere with such importations? It has been reported that surplus property abroad has not easily been brought back to this country.

"The basic policy of the country is briefly summed up as the promotion of freedom of initiative in trade and investment, with a minimum of artificial restraint and it is suggested that this policy is well adapted to the aim of promoting peace."

Why should there be any thought of conflict in the field of foreign trade between keeping the peace and strength in event of war? Might it possibly be that this is a carryover from the idea of so many agricultural economists that we must get rid of much of farm production in foreign lands if the farmer is to be prosperous, or of the industrialist that he must have foreign markets if his profit and loss statement is to be pleasing to his stockholders? Have economists unconsciously accepted the Marxist criticism of the capitalism that capitalism cannot survive without foreign markets in which to dump a part of its output?

We say we must export in order to import! But what is it that we need from foreign lands that they would not sell us if we gave them a chance?

We are told "that every economist knows that the limitation on our total exports today lies in the world's ability to earn or borrow dollars and not upon the restrictions imposed by any one country." If this be so, and there is no reason to doubt it, why do we persist in our emphasis on foreign markets for our foods rather than on American markets for foreign goods?

Last evening Mr. Elmhirst suggested that man was something other than a "consuming animal." For that suggestion we might find the answer to the economist emphasis on "selling" rather than on "buying" when he talks of foreign trade.

THE EUROPEAN RECOVERY PROGRAM AND THE AMERICAN FARMER*

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THE American farmer has good reason to be interested in the European Recovery Program—primarily in the longer-run effects of the Program on European production and trade. He wants to know how much recovery and change in Europe's agriculture can be expected by the time the Program is ended. And he is anxious to have the Program contribute heavily to the development of European export industries that can finance continued large agricultural imports.

In this paper special emphasis will be placed on assessing the the past and prospective recovery and redirection of European agriculture. Secondary attention will be given to the import needs of the ERP countries and to the related benefits and adjustment problems that American farmers can expect to result from the Recovery Program.

Three Years of Agricultural Recovery

How much agricultural recovery has already occurred in Europe? This is not an easy question to answer. Many of the postwar crop and livestock estimates of European governments are almost certainly too low, and there is no basis for determining the *degree* of underestimation involved. The FAO consistently publishes the official estimates, whereas the Office of Foreign Agricultural Relations often publishes higher unofficial approximations.

Despite quantitative uncertainties, several facts about the postwar agricultural recovery of Europe are fairly well established. First the low point in farm output was reached in the crop year 1945-46, when the total production valued at prewar prices apparently amounted to only 65-75 percent of the average for the last five prewar years.¹ This low level was due in part to shortages of trained

* A paper given at the Annual Meeting of the American Farm Economic Association, Green Lake, Wisconsin, September 14, 1948.

¹ An FAO study, based on official figures, estimates the agricultural output of 1945-46 in 23 European countries at 63 percent of the level in 1935-38 (United Nations, Department of Economic Affairs, *A Survey of the Economic Situation and Prospects of Europe*, April 1948, pp. 10-12). In contrast, the OFAR, using adjusted figures, estimates the 1945-46 "total farm output" of Continental Europe ex USSR at about 75 percent of the prewar average (*World Food Situation 1948*, February 1948, p. 43). The present writer believes that this wide range of estimation cannot be narrowed appreciably on the basis of evidence now available.

farm workers, draft power, farm equipment, fertilizers, and good seed, to agrarian reforms and population shifts in Eastern Europe, and to substantial destruction of crops and livestock through military operations. Important as these war-associated factors were however, they deserve little more emphasis than the prolonged, drought of 1945, which took heavy toll of crops and pastures throughout the Mediterranean and Danubian areas.

In the following year, European farm production rose to something like 73-83 percent of the prewar level. Weather conditions were generally favorable except in southeastern Europe, where drought again sharply reduced the Danubian harvests. In other areas, crop increases were limited mainly by disorganized transport and by persistence of many of the shortages of the preceding year.

Considerable progress was made during 1946 in returning workers to their farms and in providing farmers increased supplies of production equipment and fertilizers.² In the fall of 1946 European farmers reasonably hoped to expand their sowings of better seed on better-prepared and better-fertilized land. But atrocious weather defeated them. In western Europe winter set in before the planned sowings were completed. Later, record-low temperatures heavily damaged the planted crops. Finally, the summer of 1947 brought one of the worst droughts in history to central and western Europe. In consequence the production figures for 1947-48 were lower than those of the preceding year.

In view of these circumstances, one must look to the 1948 output figures for the first reliable indication of the degree of agricultural recovery in Europe. The preliminary crop figures now available suggest a European bread-grain harvest equal to 85-90+ percent of the prewar average and a total grain-potato-sugar output of similar proportions. Since the production of animal products will be relatively smaller, we can now expect the total agricultural output of Europe to be larger in 1948-49 than in any preceding postwar year, but still some 15 percent or more below the prewar level. This implies a rate of recovery in agriculture lower than in other sectors of Europe's economy.

² U. S. State Dept., Pub. 3098, *Commodity Reports including Manpower* (Jan. 5, 1948), esp. pp. 113-14, 126; H. Rept. 1845, 80th Cong., 2d sess. (Final Report on Foreign Aid of the House Select Committee on Foreign Aid Pursuant to H. Res. 296), pp. 551-56; International Emergency Food Council, *Report of the Secretary General to the Fourth Meeting of the Council* (July 1947), pp. 73-75, and *ibid.*, . . . to the Fifth Meeting of the Council (October 1947), pp. 48-49.

The various countries and products have not shared equally in the recovery to date. In the United Kingdom and Eire, farm output has recently been even larger than in 1934-38. In Italy, Spain, Portugal, Switzerland, the Scandinavian group and maybe France, current production is apparently close to 90 percent of the prewar average. In sharp contrast, Germany, Austria, Poland, Hungary, and Yugoslavia have grain and potato crops that appear at least 20 percent below prewar levels, and their output of animal products is probably even lower. Extensive war destruction, social and agrarian reforms, and population shifts have operated against speedy agricultural recovery in these countries; and in Germany, reduced supplies of fertilizers and farm machinery have been important contributing factors.

Among the various farm commodities, animal products have recovered less fully than products of vegetable origin, and pig and poultry products less than other animal products. These relationships are normal in periods of food shortage, since animals—particularly pigs and poultry—compete with human beings for grain. Certain crop-structure changes since prewar years also appear significant. Particularly impressive are the sharp fall in the rye acreage and big percentage increases in the areas devoted to vegetable oilseeds, fibers, and tobacco. Yet rye remains a major European crop, and the oilseeds, fibers, and tobacco are still very minor crops.

Prospective Recovery by 1952

Let us now consider the prospects for further recovery by 1952 in (1) the ERP countries, and (2) the countries east of the "iron curtain."

Volumes have been written on the economic plans and prospects of the ERP countries; and their agricultural production goals and import requirements have been subjected to close scrutiny by American experts. I shall merely summarize, therefore, what these plans suggest with regard to future production in the ERP countries (including Western Germany). The original estimates in the *Report of the Committee of European Economic Cooperation*³ broadly indicated that prewar crop and livestock levels could be restored by 1950-51 in most of the ERP countries. Indeed, the over-all pro-

³ U. S. State Dept., Pubs. 2930 and 2952 (released September and October, 1947). See also revised estimates in *ibid*, *Commodity Reports* . . . , pp. 81-104.

duction goal for that year was put above the 1934-38 average. Significant net increases in production were anticipated for coarse grains, potatoes, oilseeds, sugar, tobacco, fruit, milk, and eggs, with no appreciable change from the prewar level in the total output of bread-grains and a decline in meat production largely confined to Western Germany and the United Kingdom. As a group, these countries expected to have more cattle, sheep, and poultry, but fewer horses and pigs, than in 1934-38, with practically all the decline in pigs concentrated in Western Germany, Austria, and the United Kingdom.

In analyzing these estimates, American experts suggested that the grain crops might well be increased more rapidly and livestock numbers and animal products less rapidly. The American estimates thus implied that prewar production levels for meat, milk, and eggs would not be fully restored by 1950-51 or even 1951-52; and they indicated that sheep, as well as pigs and horses, would probably still be below their prewar numbers. Furthermore, even the increased grain figures of the American experts implied a lower *per capita* output of grain in the ERP countries in 1951 than in 1934-38.

Greater uncertainties are involved in trying to appraise the prospects for agricultural recovery in Soviet-dominated Eastern Europe. The Committee of European Economic Cooperation assumed that the flow of agricultural surpluses from Eastern to Western Europe would be resumed during the next few years and that the flow of cereals would reach prewar proportions by 1951.⁴ This view, however, is open to question on several grounds.

Let me present a few of the pieces in this complex jigsaw puzzle. We have already noted that agricultural production in most of the eastern countries is still substantially below prewar levels within comparable boundaries—perhaps a fourth or more below in Poland and Eastern Germany, a fourth to a fifth below in Hungary and Yugoslavia, and a fifth to a tenth below in Rumania, Bulgaria, and Czechoslovakia. Land redistribution in Eastern Europe—particularly in Poland, Hungary, and Rumania—has reduced the size of most farms to dimensions normally associated with inefficiency, and it has increased the area cultivated by farmers with little “know-how.”

These considerations and also experience with the agrarian reforms of 1918-21 suggest that full recovery of farm production may

⁴ Vol I, p 48

be delayed a number of years in several of the Soviet-dominated areas. Yet only for Poland is this prospect clearly indicated in the published agricultural plans. The Polish plan calls for a total agricultural output in 1949 equal to only 75-80 percent of the prewar level; and full basic recovery, therefore, seems out of the question by 1951. In contrast, the plans of Yugoslavia, Bulgaria, and Czechoslovakia all specify significant increases above prewar levels by or before 1951; and even for Hungary the Communist Party plan envisages recovery to 95-100 percent of the 1938 level by 1949-50.⁵ Finally, though less complete information is available for Rumania, the grain area planned for that country for 1949 closely approximates the prewar average, while substantial increases are indicated for sugar and the major industrial crops.

We may well ask what major assumptions underlie the optimistic plans of the Eastern countries and whether these are realistic. All the plans assume increased mechanization, more fertilizer, improved seed, better cultural methods, and a broad shift toward greater diversification and intensification of agricultural production. In the past, such changes have come only gradually in backward countries, but many Communist planners in Eastern Europe are convinced that these improvements can be introduced rapidly under state guidance through the agricultural co-operatives they are promoting. The Yugoslav plan is one of the most optimistic, counting on yields per acre in 1951 typically 10-20 percent higher than on the average in 1934-38 and on increases in livestock ranging from 15 percent for cattle to 70 percent for hogs. To outside observers such optimism seems unrealistic.

The outlook for grain exports from Eastern Europe is influenced also by the prospective changes in economic structure that all of the plans envisage. Increased emphasis is put on industrial development and, in agriculture, on pig-raising and sugar, fodder, and industrial crops. Part of the acreage required for the enlarged crops is to come from reduced sowings of one or more major grains—of maize in Yugoslavia and Rumania, of wheat and rye in Hungary, of wheat and maize in Bulgaria, and of rye in Poland and Czecho-

⁵ Bank for International Settlements, *Seventh Annual Report* (Basle, June 1947), p. 156; United Nations, *A Survey of the Economic Situation* . . . , pp. 135-39; France, Ministère de l'Economie Nationale, *Etudes et Conjoncture, Economie Mondiale*, July-August 1947, esp. pp. 96-97, 113-15, 140-42, 146-47, *Foreign Agriculture* (U. S. Dept. Agr., Off. of For. Agr. Relations), February 1948, p. 37; Canada, Department of Agriculture, *Agriculture Abroad*, various issues.

slovakia. Several of these countries, however, plan larger areas of other grains than they had in the prewar period, and most of them anticipate that increased yields per acre will go far toward offsetting their reductions in grain area.

It is impossible to foresee how these and subsequent plans will affect the grain production of Eastern Europe. The generalized plan to reduce sowings of grain and to expand other crops and pig-raising is in line with the observed tendency to intensify and diversify production on smaller farms. But it seems unlikely that the current poor farming conditions and practices in Eastern Europe can be improved rapidly enough to raise yields per acre materially by 1951; if not, the reduced grain acreage will mean a correspondingly reduced production (with average weather).

Two other questions are involved in the outlook for grain exports from Eastern to Western Europe: (1) How much grain will the Eastern countries use at home? (2) How much will they send to the USSR? Only a bold person would hazard specific answers to these questions. I shall merely discuss three factors that have an important bearing on the answers. Here and elsewhere, I take no account of the unforeseeable changes that would be introduced should there be a critical worsening of American-Soviet relationships.

First, the food use of grain in Eastern Europe will presumably be affected by population changes. The present population of Poland and Czechoslovakia is perhaps 20 percent *smaller* than the average for the same boundaries in 1934-38, while that of the four Danube exporting countries is less than 5 percent larger.⁶ Even with appreciable increases by 1951, the total population of the satellite areas will probably be 8-10 percent *smaller* than in the prewar period, reductions in Poland and Czechoslovakia more than offsetting the estimated net increase of 6-8 percent in the Danube exporting countries. If there is no significant change from prewar years in the *per capita* consumption of grain for food (which seems possible), the population changes in these areas will bring corresponding changes in the use of grain for direct human consumption.

Second, the amount of grain retained in Eastern Europe for livestock feeding during the next five years will depend largely on the rate of restoration and expansion of the depleted herds of that

⁶ The population approximations in this paper are based mainly on estimates in *World Population Estimates* (U. S. State Dept., OIR Report No. 4192, Mar. 1, 1947), and United Nations Statistical Office monthly releases on population.

region. The agricultural plans of all the Eastern countries call for exceedingly rapid increases in livestock numbers, with emphasis on pigs and poultry—animals that are heavy consumers of grain and potatoes. Fulfillment of these plans necessarily depends on the production of good crops, on a moderate (rather than large) flow of grain reparations to the USSR, and on relatively light exports. It seems most reasonable to anticipate that the increase in grain production will be slower, and the volume of grain exports and reparations larger, than would be consistent with attainment of the present livestock goals. Beyond 1951 the outlook is even more uncertain. If the Eastern countries carry out their present intentions to intensify and diversify their agriculture and to emphasize livestock raising, their former grain surpluses may virtually disappear; and they may offer for export increased quantities of livestock and animal products—grain “on the hoof” and in refrigerator cars.

Finally, we want to know whether the grain and livestock surpluses of Eastern Europe will flow eastward or westward. This will probably depend primarily on the desires of the Soviet Union, whose present five-year plan calls for a total grain acreage in 1950 about 8 percent *smaller* than the average for 1934–38 within the same boundaries. In spite of the planned cut in acreage, the USSR is counting on a 1950 grain production 12 percent above the prewar average—to be achieved by a remarkable 20-percent increase in yield per acre.⁷ Whether the USSR will or will not need substantial grain imports in 1950–51 depends heavily on what portion of the planned increase in yield is effected. Fulfillment of the plan would permit the Soviet Union to take care of the grain needs of her own population (which is expected to be 6–8 percent larger than in the prewar period)⁸ and also to provide more than enough grain for her own livestock.⁹ But if there should be a negligible increase in grain yields per acre, the *per capita* supply of domestic grain would be reduced by perhaps 10–14 percent, suggesting the need for substantial net

⁷ To insure comparability with 1950 goal figures, yield and production comparisons here and elsewhere are based upon 1934–38 averages for Russia's enlarged territory, roughly adjusted to refer to biological yields.

⁸ Based on estimates in U. S. State Dept., *World Population Estimates*, and Frank Lorimer, *The Population of the Soviet Union: History and Prospects* (League of Nations, Geneva, 1946).

⁹ Announced livestock goals for December 1950 specify smaller pig and horse numbers than in 1938 (down some 3 and 24 percent, respectively, in comparable boundaries) and substantially larger cattle and sheep herds (up 10 and 65 percent, respectively). These goals appear very optimistic in view of the depleted state of Russia's livestock in 1946.

imports. Even so, Russia's import requirements would be smaller than the decline in the per capita supply figures might suggest, since the Soviet Union used part of her prewar grain supply for export (an average 1.5 million tons yearly) and part for feeding more grain-consuming livestock than she seems likely to have in 1950-51.

Perhaps it is most reasonable to anticipate that the USSR can get along quite well in the early 1950's with small to moderate grain imports and reparations. The enlarged Soviet population will also require, however, increased imports of meat, cheese, and other animal products if anything like the prewar per capita consumption of these products is to be restored by 1951 (and even the prewar level was low by Western European standards). Yet in the future, as in the past, Russia's actual trade in grain and other foods seems likely to be determined less on the basis of calculated need than on the basis of unpredictable political policy.

Let me now summarize the main points of the preceding discussion in so far as they pertain to grain—the most important item on the ERP import list and the chief product moving from Eastern to Western Europe in the prewar period. The ERP countries need unusually heavy imports of wheat and feed grains during the next few years; and their growing populations and present agricultural plans suggest that their import needs in 1951-55 will still be considerably higher than in the prewar period. American farmers want to know where the increased grain imports will come from, particularly after ERP is ended. The CEEC countries appear to have been unduly optimistic in counting on restoration of the prewar westward flow of grain from Eastern Europe after 1951. Not only may less grain per capita be produced in the Eastern area in the early 1950's than in prewar years, but more grain may be retained there for feeding increased numbers of pigs, chickens, and other livestock that are destined partly for export, partly for increased domestic consumption. Equally significant is the possibility that the USSR may shift from an export to an import basis for grain and that she may also import substantial quantities of animal products.

The sizeable grain exports from the USSR and the Danube Basin during the past year may appear to shake some of these insecure conclusions. The Soviet Union and a couple of her Danube satellites signed trade agreements in 1947-48 for the exportation of about 4 million tons of grain, compared with average prewar exports of 6 million tons from the USSR and all Eastern exporters (including

Eastern Germany). Some people accept this as evidence of the re-emergence of a true grain surplus in those countries. More probably the explanation lies in the temporarily depleted livestock herds and in the restrictive bread rations, forced collections, and other grain controls in the Eastern area. As livestock herds are restored and expanded and food controls are relaxed during the next five years (if they are), smaller rather than larger exports of grain may be expected. Here again, however, political motives may dictate less rational and more restrictive policies.

If these very uncertain prospects are borne out, Argentina, Australia, Canada, and the United States will be called on to supply the increased grain imports the Western European countries want, so long as means of payment can be found.

Imports Under the Recovery Program

On all the ERP import lists suggested by various experts, grain far outranks every other agricultural product in terms of value, followed at considerably lower levels by cotton, fats, meat, sugar, fruits, tobacco, and dairy products. It seems probable that substantial quantities of all these commodities will be purchased with ERP funds, but the Economic Cooperation Administration (ECA) may decide otherwise.

It is important for American farmers, other potential American pressure groups, and consumers in the ERP countries to understand clearly the guiding principles ECA officials must follow *if the Recovery Program is to be a success*—successful in fulfilling the objective of the Foreign Assistance Act of 1948 to aid the participating countries “to become independent of abnormal outside economic assistance” by June 30, 1952—independent at a high, not a low, level of production and trade. Such success would presumably mean that American consumers would be increasingly well supplied with desired European products, that American taxpayers would be freed from the burden of making heavy grants to Europe, and that American farmers and industrialists would have a wider European market for their products than in prewar years.

Such a high degree of success cannot be achieved easily. With Germany lagging, it will be difficult enough to raise the production of Western Europe even to the prewar level. And it will be still more difficult to close the gap in the balance of payments of the ERP countries, because they have lost foreign investments that in 1938

netted about a billion dollars a year. The magnitude of the problem involved is indicated by the conservative American estimate that the ERP countries will have to expand their merchandise exports some 30 percent above the prewar volume just to pay for imports of prewar size.¹⁰

The success of the Recovery Program, therefore, is not assured. It is possible only if there is unprecedented cooperation among the ERP countries themselves, and if top officials in those countries and in the ECA continuously act in the spirit of the Foreign Assistance Act. Reflecting this spirit, Administrator Hoffman declared forcefully last July: "We are not distributing relief . . . We are, from my standpoint, investment bankers for recovery."¹¹

Spelled out in more specific terms, this guiding principle would seem to mean that ERP funds should be spent so far as possible on the importation of *production goods* and "know-how"—that the smallest possible portion should be spent on immediate *consumption goods*. Indeed, expenditures on consumption goods appear warranted only in so far as they are essential to the maintenance of health, political freedom, and economic efficiency in ERP importing countries or in so far as they promote efficient export industries in ERP exporting countries. But all import requests—including those directly or indirectly designed to increase the productive power of the ERP countries—should be scrutinized as to their probable contribution to satisfactory solution of Europe's difficult balance-of-payments problem. And ERP funds should be used to stimulate only those industries that have a fair chance of survival on a competitive basis after ERP is ended.

Let's consider how the ECA authorities, in their role as "investment bankers for recovery," might deal with a few specific import problems. Both the CEEC and our own government experts have suggested that the ERP countries import in every year of the ERP period considerably more meat, cheese, processed milk, dried fruits, wine, tea, and tobacco than they imported on the average in 1934–38. And particularly for the later years of the program larger imports are also specified for eggs, fresh fruits, and fresh vegetables. Every one of these products ranks as a luxury-consumption item and should be inspected critically. Moreover, special attention

¹⁰ U. S. Congress, Senate, Committee on Foreign Relations, *Outline of European Recovery Program Draft Legislation and Background Information submitted by the Department of State . . .*, 80th Cong., 1st sess. (Dec. 19, 1947), p. 70.

¹¹ U. S. Dept. Comm., *Foreign Commerce Weekly*, July 24, 1948, p. 14.

should be given to the proposed inadequate imports and planned reductions in per capita consumption of bread grains, fats, and sugar—the cheaper foods that can normally be counted on to help balance the budgets of needy nations as well as needy families

Consider first the proposed wine, tea, and tobacco imports. None of these products is essential to the maintenance of health. But since the bulk of the wine imports and about half of the tea imports would come from ERP countries and their dependencies, the ECA might well question whether support of these industries would contribute to later balance of Europe's foreign accounts. This possibility does not exist for tobacco, which would be purchased mainly from the United States with ERP dollars badly needed for other United States exports. In general, it would seem reasonable to approve only the minimum imports of each of these products required to maintain public morale unless support of the wine and tea industries should appear justified as a good recovery investment.

Somewhat different problems are raised by the high import allowances suggested for fresh fruits and vegetables. The ERP countries and their dependencies would supply all of the vegetable imports and most of the fresh fruits. Encouragement of vegetable and fruit production in these countries is probably warranted, because it is in line with recent consumption trends and also with the tendency to develop a more intensive agriculture in Western Europe. In contrast, the use of ERP funds for financing imports of Western Hemisphere fruits would almost certainly operate against the success of the Recovery Program.

More important are the proposed increases in imports of meat, cheese, and eggs. The suggested imports would leave the over-all supply and consumption of animal products in Northwestern Europe materially lower than in 1934–38, but still considerably higher than in most other parts of the world, and higher also than health considerations alone would demand. The animal-product consumption problem of the ERP countries is thus mainly a psychological problem which warrants further investigation. The problem is particularly hard to solve because the dollar cost of imports is heavy and the suggested increase in imports—destined mainly for the United Kingdom—would be difficult or impossible to maintain after the ERP period. There is the additional question as to whether a larger proportion of the animal-product consumption of the ERP

countries could not be produced more economically at home. North-western Europe, with its dense, educated populations and favorable climate, is especially fitted for intensive, scientific farming in which livestock are important. Smaller imports of animal products and (if necessary) larger imports of grain to permit more rapid increase of some of the domestic herds would put less strain on the Recovery Program and also promote better long-run adjustments.

This partial solution, however, would raise the question as to where the increased imports of feed grains could be obtained. Under existing conditions (which include government price and export controls for both meat and feed grains, long-term contracts for prospective meat surpluses, and increased consumption of meat in the United States and a number of other countries) there is no assurance that the ERP countries could secure extra supplies of feed grain even if dollars were made available for that purpose. Yet it is possible that the ECA could make special arrangements with some of the exporting countries to divert more grain to the international market. And it is possible that Argentina, faced with an assured foreign outlet would adjust her agricultural price structure to encourage early restoration of her higher prewar levels of production and export of corn. These and other possibilities might well be investigated before ERP funds are used for increased imports of animal products.

In any case, one of the elements essential to rapid economic recovery in Europe is the acceptance of consumption levels considerably below prewar standards. It is necessary to encourage as much investment as is consistent with health, political freedom, and economic efficiency. Just as the German people were told that they could not have both "guns and butter," so the people of North-western Europe must be made to understand that they cannot have both meat and machinery in large quantities. This does not mean that hunger is to be condoned or tolerated: indeed, the calorie-intake level should promptly be raised in several of the ERP countries—especially Western Germany. It means not less food than in the prewar period, but less palatable food—more cereals, potatoes, fats, and cheap vegetables; less pork and other preferred animal products, less overseas fruit, and less tea and coffee. Perhaps the greatest danger inherent in the Recovery Program is that the various countries will try to maintain (with ERP funds) consumption levels that they cannot now afford and that they will still be

unable to afford after 1952 if the ERP funds are used improperly.

The degree of success of the Recovery Program will be determined not only by the decisions and actions of officials in the ERP countries and in the ECA, but also by the decisions and actions of other officials in various countries. Particularly needed now are appropriate actions to combat inflation, to discard unsuitable price and marketing regulations, to allocate increased supplies of fertilizers, feed grains, and machinery to the ERP countries, and to modify all exchange and trade policies that handicap either the Recovery Program or the balancing of Europe's trade accounts.

Meaning to American Farmers

Now let me summarize briefly what the European Recovery Program and the recent and prospective developments in European agriculture may mean to American farmers.

The most obvious result is an increased four-year demand for the major export crops of the United States—especially grain, but also tobacco and cotton. These products have usually accounted for some two-thirds of the value of United States farm exports, they have been in excessive supply in many years since 1931, and large exportable supplies can be expected in the future. But whether the increased ERP demand should be accounted a benefit or an affliction depends on whether it can be sustained after 1952. A purely temporary demand on our currently inflated markets would merely postpone and make more difficult the eventual downward adjustments in price and production that would be required.

The chief question, then, is: Can American farmers reasonably expect a much heavier export demand for their products after 1952 than existed in prewar years? Under conditions of actual and prospective peace, the answer seems likely to depend primarily on four factors: (1) on whether the Western European countries (including Germany) will want to import increased quantities of these products from overseas; (2) on whether they will be able to produce enough exportable goods and services to pay for increased imports; (3) on whether the United States will be willing to make the needed dollars available; and (4) on whether American farmers will be willing to sell their chief export products at prices that are internationally competitive.

I have already indicated that present signs point to a redirection in European agriculture that will provide an expanded market for

overseas grain so long as means of payment are forthcoming. And the increasing population in Western Europe as well as the general upward trend in per capita consumption of tobacco suggest that the import demand for this product, too, may be permanently increased in the absence of payment difficulties.

The chief basis for hope that the ERP countries will be able to finance increased imports lies in our Recovery Program. If the funds made available under that Program are spent with due emphasis on imports of production goods and "know how," the productivity of these countries could conceivably be raised enough to expand their exports 30, 40, or even 50 percent above the prewar volume. Since a 30-percent increase is required just to pay for imports of prewar size, an appreciably larger increase is necessary if Western Europe is to contribute substantially to the desired expansion in world trade. Such a goal is undoubtedly ambitious; it can be achieved only through austerity in consumption, hard work, good judgment, and the abandonment of traditional, inefficient methods of work.

It is perhaps difficult to avoid a "defeatist" position in considering the supply of American dollars likely to be available for financing European imports from the United States after 1952. This hinges on the willingness of our country to take imports from other countries. Our past record in this respect has been bad; many of our present laws and institutions are based on erroneous concepts of the relationship of imports to American prosperity; and our Congress has many members who have no understanding of the economic principles of international trade. Yet the situation is not hopeless. We can point to the reciprocal trade agreements sponsored by the United States, to the efforts, to the efforts of our State Department in promoting the International Trade Organization, and to the realistic attitude that Congress has shown during the past five years in dealing with pressing international economic problems.

The next obvious step is for the Congress and the Executive Departments actively to encourage suitable imports. Without such a new approach, American farmers and industrial exporters cannot hope to sell heavily to foreign markets after 1952—unless, of course, American taxpayers are willing to "foot the bill." When this idea is widely understood, and when our Congress finally learns that no American industry can be "protected" from foreign imports without correspondingly reducing the foreign markets available to other American industries and American farmers, more appropriate trade

legislation will be passed. It is important, however, that this change not be delayed too long. Many of the pressing economic problems likely to be faced in the coming decade could be partially solved by an expanding world trade. And only the United States, the world's leading creditor, is in a position to take the initiative in relaxing import restrictions and in actively searching for suitable imports. Heavier American imports would mean heavier foreign exports which, in turn, would purchase heavier American exports.

If American farmers could count on a satisfactory solution of the dollar problem and on a heavy European demand for overseas wheat, tobacco, and cotton after 1952, they could look forward to widened opportunities to export their major surpluses. These developments would provide American farmers *opportunities to export, not guaranteed export markets*. Whether our agricultural exports would be large or small under these conditions would depend on American farm prices. Past experience, current American farm legislation, and the existing high level of agricultural prices in this country all point to the danger of American farmers pricing their own products out of potential foreign markets by insisting on government price supports at excessive levels. Continuation of this policy would be extremely short-sighted. It would result (as high export prices did earlier) in the expansion of grain, tobacco, and cotton production in other exporting countries and in the establishment of European trade barriers designed to encourage increased domestic production of grain and synthetic fibers. One can only hope that American farm organizations will abandon their insistence on high government price supports before it is too late.

In conclusion, then, a number of difficult problems must be properly solved before American farmers can count on lasting favorable effects from the European Recovery Program. Several of the solutions depend upon appropriate cooperative action by foreign and American government officials. But the American agricultural price problem, at least, must be mainly solved by American farmers themselves.

DISCUSSION*

LOIS BACON

Mrs. Farnsworth's excellent paper has brought into sharp relief what the European Recovery Program means to the American farmer—a chance

* A discussion given at the Annual Meeting of the American Farm Economic Association, Green Lake, Wisconsin, September 14, 1948.

to retain and perhaps expand his prewar export outlets in Europe in the more distant as well as the immediate future. Admittedly the odds are long, but I think it must be added that without ERP there would be virtually no chance of keeping these export outlets open on a self-financing basis.

Among the various problems discussed, prospects for agricultural production in eastern Europe and east-west trade in farm products seem to me of particular interest. Restoration of the trade between eastern and western Europe is generally emphasized as vitally important to the economic recovery of Europe, and is one of the expressed aims of ERP. Mrs Farnsworth, however, suggests the possibility if not the probability that eastern Europe's agricultural exports will be smaller than before the war and will be directed eastward rather than westward. In this case, the flow of trade between eastern and western Europe could hardly attain the desired proportions.

Few impartial students of the area would disagree, I believe, with the conclusion that if prewar consumption levels are maintained or increased, eastern Europe's agricultural export surplus will for some time be smaller than before the war, for it is difficult to envision any likely set of circumstances under which per capita production in eastern Europe can be quickly restored to the prewar level. Even for a gradual recovery, eastern Europe needs a period of more or less settled political and economic conditions. Such a period may be indefinitely postponed by the recent drive for collectivization of agriculture.

Should Soviet control over the satellite countries be strong enough to force through collectivization rapidly, grain production may be expected to fall and livestock numbers would probably also decline. How much collectivization would reduce the level of output is impossible to say, but unless a very heavy drop occurred it would not necessarily be fully reflected in exports. The collective system of farming permits a high degree of state control over output, and, while the eastern European countries might not be willing or able to go so far as the Soviet Union, strong Communist governments would perhaps have little hesitation in curtailing or holding down consumption in order to export when it suited their purposes. Like the Soviet Union, the eastern European countries are intent on fostering industrialization. If this aim is given high priority, they might export substantial quantities of grain and export them to the west, provided that the west agreed to send in exchange the needed machinery and industrial equipment.

The urge to industrialize will remain and may even be given freer rein if the eastern European countries are able to maintain a measure of independence from the Soviet Union. On the other hand, actual collectivization of agriculture may not be pushed. Continuation of small-scale peasant farming, which now characterizes the region throughout, is consistent, as Mrs. Farnsworth stated, with the planned shift in emphasis from commercial grain to livestock production. It would also mean virtually no control over farm deliveries, so that increases at least in farm consumption could not be prevented and the recovery in output for sale would probably

lag behind the recovery in total production. Nevertheless, a significant volume of agricultural produce, perhaps weighted more heavily with livestock products than before the war, might be offered to the west, again provided that it was the means of securing machinery and industrial equipment.

To mention the conditions for drawing agricultural products from eastern to western Europe may be only to underline the unlikelihood of a flow in that direction. As Mrs. Farnsworth has pointed out, the Soviet Union may need grain and will certainly need livestock products if per capita consumption is to approach prewar levels. Without attempting to predict the future, it seems improbable that the Soviet Union would permit the diversion of available supplies to the west unless it received something urgently wanted in return. If this proves to be so, the question remains as to whether the west can or will wish to meet Soviet desires in order to obtain food from the east.

There are two other points I should like to consider briefly in the time remaining. The first concerns agricultural recovery in western Europe. Over large parts of the region it has been impeded not only by shortages of means of production and unfavorable weather but also by the critical economic situation. Lack of confidence in the currency and scarcities of consumer as well as producer goods have weakened the farmer's incentive to exert himself to the full since he has been unable either to save money with any feeling of security or to invest as much as he would like in his farm and household. Perhaps the most effective aid to agricultural recovery provided by ERP is the opportunity to stabilize currencies and otherwise give the farmers a compelling motive for increasing output. Unless the most is made of this opportunity and made soon, production plans in a number of countries are likely to be unfulfilled.

The second point has to do with trade between the ERP countries. This trade, the restoration of which is so vital a part of European economic recovery, has been retarded by the use of foreign trade and exchange controls in nearly all ERP countries to confine imports to staple foods and other commodities considered essential to national recovery and by the shortage especially of European exportable goods that the ERP countries consider essential. Europe is covered with a network of bilateral agreements, but with both parties to the agreements in most cases striving to obtain much the same essential goods, avoid taking luxury and semi-luxury goods, or what are classed as such in the present emergency, and at the same time equalize the flow of trade between them, the actual exchange of goods has been below the level warranted by physical availabilities.

If some of the obstacles to intra-European trade are minimized through the recently adopted plan for using a part of the ERP dollars to help finance that trade, agricultural exports, which are an important source of foreign exchange for a number of ERP countries, should benefit. This will tend to increase gross imports into ERP countries over present low levels of some of the more expensive kinds of foods and speciality products, since they make up the bulk of western Europe's agricultural exports. Wine and fresh vegetables are outstanding cases in point in that exports from ERP

countries plus French North Africa, which stands in a special relation to France, cover practically all the import requirements of ERP countries, and in addition wine is sent overseas. Incidentally, the CEEC figures I have seen suggest a reduction in wine and fresh vegetable import requirements during the ERP period as compared with the 1934-38 average.

The more one looks at some of the uncertainties and difficulties connected with even a few of the problems confronting those responsible for the operation of ERP, the more impressive the size and complexity of their task appears and the greater the inclination to stress, with Mrs. Farnsworth, that the success of the program will not be easy to achieve. Yet it also seems important to me to bear constantly in mind that ERP offers a hope and the first real hope of at last emerging from the crisis that has plagued us since the close of the war.

ROUNDTABLE ON PROBLEMS OF GRADUATE STUDENTS

Chairman: E. L. Butz, Purdue University

CAN GRADUATE TRAINING RISE ABOVE INSTITUTIONAL "INBREEDING" OF IDEAS?*

K. E. OGREEN

University of Minnesota

INBREEDING" of ideas implies that viewpoints and ideas are accepted without independent thinking and analysis. A high quality graduate training cannot be achieved if such "inbreeding" of ideas takes place. A major goal of graduate study is the development of an ability to think effectively and to utilize techniques of analysis in order to independently arrive at relevant value judgments. The development of independent viewpoints is especially important in a social science field. The social scientist is often forced to make decisions when there is insufficient evidence or adequate standards of value from which a conclusively true or false judgment can be reached. Dogmatic acceptance of ideas presented during graduate training will not be adequate preparation for future decision-making under different environmental conditions.

Can graduate training rise above institutional "inbreeding" of ideas? The graduate student must first reorient his perspective toward objectives of education, if he has not already accomplished this during undergraduate training. Much of the educational value of undergraduate study is lost because the student's attention is focused on learning the informational facts prerequisite to the grades and credits necessary for a bachelor's degree. Too often the student expects specific answers from the professor, while the professor is so intent on presenting informational facts and developing his own viewpoints that he does not encourage independent thinking on the part of the student. Reorientation of the student's thinking and educational perspective is not solely his responsibility. Many of the ideas and judgments acquired from institutions such

* A paper given at the Annual Meeting of the American Farm Economic Association at Green Lake, Wisconsin, September 14, 1948.

as the family, church, and other school levels were based on biases, prejudices, and ineffective thinking both on the part of the individual himself and the personnel of these institutions. Likewise, in graduate training, avoidance of "inbreeding" of ideas is a responsibility both of the student and the graduate faculty personnel.

First, the department or administrative head has a definite responsibility—that of building a staff which can acquaint students with a diversity of analytical tools and techniques of analysis. Departmental "inbreeding" is often associated with a policy of recruiting staff members who were trained at that institution. However, this is only one of several "danger signals" that may exist. Faculty members coming from different institutions may all tend to emphasize one particular approach, such as empirical, theoretical, or institutional. More than one regional environment should be represented in the faculty membership as well as individuals who received their educational training during different time periods. These are neither necessary nor sufficient conditions for a diversified staff, but they can be regarded as positive indicators. The general role that the department head himself plays is important. Are other faculty members encouraged to express points of view that may disagree with the philosophy of the department head? Or does he tend to build a faculty which is in agreement with his particular philosophies?

Specific "inbreeding" of ideas may arise, to a large degree, through the individual staff members in their classroom and other contacts with graduate students. The instructor's function is more than description and explanation, it is also judgment and appraisal. But these judgments and appraisals should not be presented as final truths. The student should obtain from a course of study not the final answers, but a motivation toward additional study and research that will aid him in arriving at his own independent evaluations. The instructor reflects, quite naturally, what he believes most important in his classroom lectures, assignments, and also in his examinations. The instructor must be on his guard to acquaint and direct students to a variety of viewpoints and analyses, particularly through his reference assignments. Grades and examinations are perhaps a necessary evil in graduate work. But the examinations should be concentrated on testing the student's ability to apply analytical tools of analysis, not the memorization of informational facts or a reiteration of the instructor's own value judgments.

The presentation of too much classroom material may also be harmful because the student will have so much to think about that he will be forced to rely solely on the instructor's appraisals.

Finally, the graduate student himself must accept a responsibility for the diversification of his training. He can obtain a diversity of viewpoints and ideas from a wide range of reference books and professional journals that are at his disposal. He is not necessarily limited to the environment and particular approach of a single institution. However, attendance at several institutions does not by itself provide a satisfactory solution to this problem of "inbreeding" of ideas. A college or university which offers graduate training, particularly Ph D. programs, has a definite responsibility to build a staff of the capabilities described earlier in this paper.

SPECIALIZATION VS. DIVERSIFICATION IN COURSE WORK*

H. G. DIESSLIN

Purdue University

THE first academic economist, Adam Smith, probed into the nature and causes of the wealth of nations. He pointed out the economic policies in his time that would lead to the greatest political and social welfare of the individual countries and the world,

As this social science developed during the century following Smith, it became a more abstract, "ivory tower," deductive, theoretical analysis centered around maximizing profits of the individual firm and to a lesser degree the industry. It tended to seal itself off from the aspects related to the political and social welfare of society. Economics, like many of the social sciences, evolved and developed around a hub without seeing the rim around the whole economy, consequently, economics as well as other social sciences often exhibited a tendency to be inflexible and unadaptable.

Since the depression of the early 1930's, the government has invaded nearly every phase of our economy; this is particularly true in agriculture. The emphasis of economic analysis shifted from a micro-economic study of the firm to a macro-economic or aggregate approach to the industry and national economy as a whole.

Agricultural economics originally developed around farm management. Today it is not uncommon to find eight or ten fields of major specialization offered by the agricultural economics departments of land-grant colleges. Farm organization and farm management, work simplification, marketing, prices and statistics, finance, policy, land economics, and rural sociology are examples of such specialization.

The typical agricultural economist who has grown up on a farm, attended rural schools, graduated from a college of agriculture, and majored in agricultural economics has no trouble developing a special interest viewpoint. But, does he also have command of the techniques so that he may cope with today's economic problems relating to agriculture from a political and social point of view?

Agricultural economics has developed in the form of empirical observation and analysis rather than pure theoretical analysis because it deals with the practical problems of the agricultural

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industry. Although economic theory is a part of the training of practically all agricultural economists, a controversy continues to rage over the value of theory in this training. Howard Conklin gives an excellent interpretation and discussion of the complementary relationship of theory and empirical observation in a recent article in this JOURNAL.¹

In the immediate past there has been a tendency toward extreme specialization within agricultural economics, with the consequence that the place of agriculture in the rest of the economy, its dependence upon the other sectors of the economy, and the tremendous inequalities within agriculture itself have often been overlooked. To refute specialization *per se* is to refute one of the first principles of economics—i.e., division of labor. However, the first responsibility of the graduate student today is to acquire a working knowledge of the tools he needs—economic theory, history and geography, mathematics, statistics, research technique, political science, sociology, logic, etc. Along with this foundation of general working tools, the graduate student has the opportunity for moderate specialization in both his Master's and his Ph D theses.

Whereas research in agricultural economics in the past often has been built primarily around the goal of maximizing profits for the individual farm or firm, today it must also take cognizance of questions pertaining to state and national agricultural policy and long-run social objectives of agriculture. To illustrate, problems of agricultural policy include the short-run instability of income and agriculture's place in and dependence on other sectors of the national economy. Questions of long-run social objectives include soil, timber and water conservation, income inequality within agriculture, and migration of excess labor out of agriculture.

The tools and techniques needed to cope with the research problems involved in agricultural policy and social or welfare projects are not to be found through extreme course specialization. The graduate student equipped with a broad working knowledge of the analysis tools of his trade, yet moderately specialized through the application of some of these tools in his thesis projects, can readily adjust himself to further specialization on the job. This should hold true if he is called on to do a piece of research involving a commodity, the firm, the industry or the national economy.

¹ H. E. Conklin, "A Neglected Point in the Training of Agricultural Economists," this JOURNAL, Volume XXIX, No. 4, November, 1947.

DUAL RESPONSIBILITY BETWEEN THE GRADUATE ASSISTANT AND THE UNIVERSITY*

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FINANCIAL assistance in the form of teaching and research assistantships has a close relationship to the number of graduate students that embark on professional careers in the rural social sciences and to the progress of their work. Such assistance, as revealed by a study of the recruiting and training of personnel in this field made about eight years ago, extended to one-third of all graduate students enrolled in agricultural economics.¹ This did not include those students engaged in hourly employment or fellowships. In light of recent expansion in certain phases of research, particularly in marketing, it is quite probable that those students on assistantships now embrace a higher proportion of all advanced students than in 1939-1940.

An assistantship in the recognized sense is a salary paid to a graduate student for work performed in assisting a professor with teaching and/or research or in the preparation of material for extension teaching. Over the years, a working relationship between the student and the department or university has evolved, in which the student is willing to accept a relatively low wage in return for experience under professional guidance, and the university is willing to help a student financially in return for aid in performing many of its minor staff functions. From personal observations, the duality of responsibility in effecting or bringing about more fruitful results to both is met with a great deal of variability. Some students look upon appointments to assistantships much as they would to outright grants or subsidies, purely a reward for past academic achievements, and barely meet the minimum work requirements; others, realizing the opportunity such apprenticeships can afford, enter into them with a great deal of enthusiasm and an attendant love of learning. Institutions, on the other hand, may reflect an acknowledged responsibility for the intellectual growth and development of its graduate students as prospective agricultural

* A paper presented at the Annual Meeting of the American Farm Economic Association at Green Lake, Wisconsin, September 14, 1948.

¹ Schultz, Theodore W., *Training and Recruiting of Personnel in the Rural Social Studies*, American Council on Education, Washington, D. C., 1941.

economists and well-informed citizens; or the institution may seem to be more interested in extracting as much menial labor as possible without regard to the all-round professional development of the individual.

The graduate schools are the spawning grounds for future teachers, research workers and administrators. At this early or preliminary stage of recruitment into the profession, when graduate assistants are selected by a department, certain obligatory arrangements or responsibilities come into being as in any employer-employee relationships.

The primary responsibility that falls upon the university is that of providing professors who are competent and conscientious in outlining the work programs assigned to graduate assistants. The student usually accepts an appointment with the thought that such an arrangement will constitute a means of broadening his experience, of acquiring some insight on practical scientific methodology, and of benefiting from the association with and counseling of professors on the staff. To be stuck off in some cubicle, as the chief engineer of an inarticulate calculator hardly measures up to his aspirations. Nor should it. Many departments attempt to provide some work of a supervisory nature for graduate students by having them work with quiz or laboratory sections. Many faculty members merely coordinate the planning of the work so that assignments in the various sections cover the same materials. In other instances, however, we find the type of faculty member who is especially interested in the teaching assistantship and therefore holds periodic group discussions of instructional problems with the teaching assistants.

The same may be said of faculty members who head research projects that are "farmed out" to research assistants. Some merely lay out the next mechanical job. Others, at a sacrifice of their own time for class preparation and other duties, spend hours in explanation of statistical procedures, theoretical implications and alternative methods of inquiry related to the problem.

By giving the background of the problem situation, by explaining the many methods of approach that have been tried and then discarded as inadequate, by making clear the reasons for following a particular procedure, much time and effort a graduate student might otherwise spend in pondering and retracing alternative procedures is saved. Not to do so may mean that the graduate assistant

in the process of carrying out his responsibilities may come up with many "new ideas" only to discover that they were old ones. If an assistant goes through such an experience four or five times, he soon drops the idea of bringing up new suggestions. Effective counseling and guidance on research projects or other work assignments can serve as real touchstones of professional development for the student, can provide an efficient means of training and can contribute to the over-all objectives of the department as well.

Many department members rightfully believe that they are responsible for considering whether or not a given graduate student may be able to use his graduate training in the future as he has planned. For example, one of the main values of a teaching assistantship for the graduate student is that it might show him whether or not he is a person who ought to plan for college teaching and take the doctorate as part of that plan.

Agricultural economics is a business of pronounced specialisms because of the regionality that characterizes agricultural problems. This, combined with the danger that a great deal of "inbreeding" of the ideas may take place often has led to research methodology or methods of inquiry that are highly particularized at each institution. Since graduate assistants are unduly exposed to the particular methodology employed at institutions which they are attending, I believe that it is the responsibility of such institutions to also present other approaches in order that the student may become aware of and appreciate the characteristics and functions of other applicable techniques in the realm of research and analysis.

The responsibility of the student, of course, is more than "putting in 20 hours each week for the Department." Timeliness in getting assigned tasks completed is important. However, unlike many employers, the university does not concern itself with the time element, the punching of a timeclock, but rather with the quality of the work that is being turned out.

The graduate assistant certainly owes to the university his finest scholarship. Scholarship is not just a matter of learning what to know, but rather, in making the greatest contribution to the working relationship we are discussing, of learning what to do with that which he has found. Indeed, from the standpoint of the assistant's own self-interest, he should utilize to greatest advantage the opportunity presented to him by the use of the university's physical facilities and the association and exchange of ideas with the staff.

However, undoubtedly the greatest contribution of the graduate assistant is an implicit one. A professor is usually required to divide his energy among many concurrent activities. He may turn to his colleagues on the staff for suggestions and discussion of particular phases of his work, but other staff members frequently are acquainted only in a general way with his specific problems. The graduate student may be among those best qualified to offer constructive criticism and advice. This means that the assistant must take an active and not a passive role in carrying out his responsibilities. Perhaps one of my professors has most amply stated the relationship when he said that he constantly looks to his graduate students, particularly the assistants with whom he is intimately working, for intellectual stimulation and criticism.

For an effective working relationship between the graduate assistant and the university, the flow of responsibilities is not channeled nor shuttled indiscriminately in either direction. Rather, there must be a constant interflow of ideas, judgments and constructive criticism. Whenever a professor forgets this, he passes up an opportunity to teach and inspire—to make a contribution to his profession; whenever a student assistant forgets it, he passes up an opportunity to learn—to better fit himself for his profession.

HOW TO STIMULATE GRADUATE STUDENT INTEREST IN PROFESSIONAL PUBLICATION*

CARL W. ALLEN
Iowa State College

TO BEGIN, I believe we must recognize that the topic of this paper deserves more than passing interest or merely an academic discussion. From information I have from editors of various professional journals, it seems that both the quality and quantity of articles submitted by graduate students could stand improvement. Apparently there is no editorial policy of the journals which necessarily work against publication by graduate students. On the other hand, there is no obvious policy which would encourage graduate students to submit for publication. This might be a good place to start—have one or more of the journals adopt an editorial policy that would encourage submission of articles by the graduate students and younger staff personnel. The two groups are almost synonymous.

It would be very easy to suggest some of the more obvious means of stimulating interest of graduate students in professional publication. We might put on a contest with a prize or other recognition of the winner or we might suggest a special issue of the journal each year containing only graduate students' articles or even a section of each issue devoted fully to work of the grad student or younger staff member (say within five years from date of obtaining an advanced degree). Among other things, this might result in some discrimination.

Rather than putting on a campaign to ballyhoo the objective and entice students to submit articles, I believe more would be accomplished if we could dig under the surface to get at some of the basic causes why such a small percentage of published articles are authored by persons while in graduate student status.

As I see it, there are three main reasons why graduate students do not write and submit more articles for professional publication. If remedial action is taken on these, the editors will work a little harder reading manuscripts.

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First, there is the lack of encouragement and help by the students' major professor (or in some cases, the minor professor). Very few of us are in a position to recognize the value of an article or idea. Nor are we familiar enough with previously published material in every case to know whether or not our ideas are sufficiently original to warrant consideration. The only solution to this is more careful thought by the student and his major professor. I realize we are all rushed for time and the pressure of other work is strong. However, a slowing up of the tempo might very easily accrue dividends. Not to be overlooked at this point are those cases where a certain amount of "exploitation" of graduate students takes place.

The notion of infallibility is the second main cause hindering graduate students in writing and submitting articles to the journals. For the most part, I suspect we have been led to think that an article which has been printed is the last word on that subject. Nothing further from the truth could exist in our minds. I believe part of the blame here can be put on the professors. This attitude must certainly be modified so as to look upon a journal article as a means of laying on the table a well thought out idea in the hopes of stimulating further thought by one's colleagues too distant for direct consultation. The number of persons in any particular field is growing quite large. No one can be expected to know them all. Writing articles for a journal serves as an introduction to other workers with similar interests.

The very nature of the work graduate students are doing works adversely toward publication. Too many graduate students work on pure statistical manipulations—applied work applied to a local situation—as a thesis. The results of this work are often considered suitable for publication locally and not generally. Professional publications tend somewhat in the direction of generalized theory, development and general application of principles and laws which apply to a wide range of phenomena. The solution to this seems to lie in the leading of students to develop and apply steps of deductive analysis, refinement of theory as applies to situations, and the theoretical solution of their problems (since these are actually important steps in research methods). They should also see how, in broad terms, the basic theory or principles of the "local" problem ties in with the over-all economic problems.

Articles in professional publications should not, on the other hand, serve merely as a "quibbling" ground. Some notes and arguments

published are boring to read because they amount to little more than a difference of opinions as to spelling, punctuation, etc. There are other instances of using an article or note under one topic to accomplish a far different purpose.

Graduate students have no desire to get out on a limb with no means of retreat. They think this will be remembered by prospective employers and work adversely toward their obtainment of a position.

As soon as the present notion of infallibility can be shoved aside and replaced with what should be the true spirit and intent of journals—a common meeting place of ideas—and if we can get our professors to do a little “prodding,” I think we will have improved our percentage of articles considerably.

After all, the mere awarding of an advanced degree does not in and of itself qualify an individual as an author. Too often, this is assumed to be the case.

I firmly believe graduate students have fertile ideas though oftentimes undeveloped. They may hesitate to express them without proper guidance.

VOCATIONAL GOALS OF THE GRADUATE STUDENT*

C. L. SCROGGS

North Carolina State College

STUDENTS in rural social sciences feel the full impact of problems encountered in graduate study when those problems become hindrances in the achievement of vocational goals. This is particularly true when such problems result in training deficiencies that limit the student's qualifications for a wide scope of job opportunities. The cumulative result of such shortcomings in academic preparation is brought to focus even more sharply when they prevent vocational advancement in whatever employment the student accepts at the end of his graduate training.

Outstanding among the problems which handicap many graduate students in achieving their vocational goals are those which have been so ably described by the preceding discussants. Certainly it seems reasonable that some prospective employers might discriminate against applicants from a graduate center which has a reputation for institutional "inbreeding" of ideas. On the other hand, such applicants might be at a definite advantage when being considered by employers who are themselves inculcated with the one-mindedness of "inbreeding." Another equally handicapping circumstance is that of educational provincialism which results when a student's entire academic training, undergraduate and graduate, has been taken at the same institution. Acquaintance with only one state or region and training in only one intellectual approach definitely limit breadth of viewpoint. This situation is even more harmful in departments where the graduate student too often is looked upon as a building brick that may be broken or forced into place in order to contribute to the over-all program of an institution or an exploitative advisor. These inadequacies alone offer justification for ranking a student's eligibility for employment below that of applicants whose backgrounds include more than one intellectual climate.

A further restrictive situation is that of narrow specialization in one field. Too definite opinions as to fields of work may close the door to graduate students for other employment possibilities. In

* A paper given at the Annual Meeting of the American Farm Economic Association, Green Lake, Wisconsin, September 14, 1948.

this case, oftentimes, the student becomes a specialist not through his own choice but because there is lack of flexibility in course work outlined for completion of his graduate training. A candidate whose graduate work ends with the master's degree is most often the victim of these rigidities in requirements. This sort of inflexibility usually is established by curriculum committees or by department heads without careful thought being given to plans that would enable the graduate student better to qualify for his vocation, be it academic work, a public career, his own business, or employment in the various fields of industry. Stress is placed upon the degree rather than upon plans and methods essential in *quality* of training. By the same token, in personnel recruitment more attention is given to degrees than to ability and competence. It is only natural, therefore, for graduate students to fall into the conventional degree-earning pattern. In other words, the degree has become a sort of vocational insurance and the trademark required for preferential consideration in job placements.

What, then, can be done by rural social scientists to assist graduate students in achieving their vocational goals? The answer is not simple, and the solution, with its many facets, is not one to be solved by graduate centers alone. The responsibility must be shared by all rural social scientists, whether in academic work, in government service, or in industry, all of which would benefit from any improvement in training and recruitment of personnel.

In viewing the over-all picture, it becomes apparent that agricultural economists and rural sociologists have not always informed their graduate students about the wide scope of vocations open to them. Particularly is there a lack of information as to opportunities available in industry, with farm organizations, agricultural cooperatives and other non-academic work. Moreover, any improvement is unlikely to be forthcoming from the environment of many graduate centers. For example, departmental isolationism is too prevalent in land-grant colleges and universities. Staff members in teaching, in research, and in extension too often go their separate ways and keep abreast of new developments and trends only in their particular departments. In turn, graduate students have only the vaguest notions about the work of departments other than teaching. The gap is even wider between staff members in the rural social sciences and their colleagues in the *general departments of economics and sociology*. Little vocational guidance can be expected when these

conditions prevail, either for graduate students or for undergraduates.

There are three recommendations which will do much toward aiding graduate students in achieving their vocational goals and to better prepare them to meet the dynamic socio-economic problems of our on-going society. It is these which will be briefly considered.

1. There is a great need for vocational monographs which will present objective data on occupations open within the rural social sciences. Such monographic descriptions should be supplemented annually by addenda on new trends and developments. Not only would information of this type give aid to graduate students and undergraduates already enrolled in the rural social sciences, but it would be invaluable in steering undergraduates of high calibre into agricultural economics and rural sociology. Many incoming college students of rural background are completely uninformed about the rural social sciences. They enroll in technical agriculture because their past associations most generally have been with men trained in the technical courses or in vocational agriculture, and there is less likelihood of their changing over to the rural social sciences if they succeed in doing superior work in their first choices.

Vocational monographs would serve an additional purpose when used by staff workers in planning teaching programs and classroom materials.

2. Previous discussion has given emphasis to the need for training and experience in appraising and analyzing socio-economic problems, with special reference to in-service training. This is excellent insofar as challenging in-service opportunities are available, but students also should be given opportunities to develop themselves in non-academic vocations that are of special interest to them. Programs of this type have been used for years by mechanical and engineering schools, and the "Antioch plan" is world famous.

In the field of marketing, for instance, the opportunity to work with any particular marketing function, agency, or commodity might do much in determining job opportunities for an individual. Difficult as the civil service procedure might be, it seems reasonable that some apprentice program could be worked out for brief employment of graduate students in agencies of the Federal government. Since so many students in the rural social sciences take approximately two academic years to complete their program of study for the master's degree, an on-the-job training opportunity

during this period could be an invaluable experience and would provide an insight into vocational possibilities. In turn, staff members handling such programs would be brought into closer contact with their colleagues in non-academic work.

3. Many graduate centers do not have the resources or the facilities to do a superior job in recruiting graduate students and in making personnel placements and/or replacements. Consequently, many well-qualified individuals never receive the consideration which their capabilities justify. In 1941, in a report prepared for the Committee on Rural Social Studies of the American Council on Education, it was recommended that department heads in land-grant colleges and universities should have civil service registers available for use in selecting graduate appointees and staff members. Recognizing that such a plan could not be carried out because of war-time emergencies, it seems warranted to call renewed attention to this recommendation and to the urgent need for its fulfillment.

ROUNDTABLE ON MARKETING RESEARCH

Chairman: Leland Spencer, Cornell University

AGRICULTURAL MARKETING RESEARCH¹

R. G. BRESSLER, JR.

University of California

*Objectives for the Marketing System and for Marketing Research**

HILE there are many social objectives to which the marketing system may contribute, the direct and fundamental goals for the system appear to be: (1) to provide efficient and economical services and ownership transfers in the movement of commodities from producer to consumer, and (2) to provide an effective price-making mechanism. In an economy that is predominantly one of private property and free enterprise, prices have the function of guiding the flow of resources into alternative employments and the flow of goods and services into alternative uses. Only insofar as the prices established by the marketing system transmit the demands of consumers back to producers and supply conditions forward to consumers with a minimum of lag, imperfection, and distortion will the economy achieve an efficient allocation and economical use of resources in satisfying wants.

From this standpoint the first objective, relating to the efficiency of the marketing system, is seen as merely a specific aspect of the second. The creation of marketing services does not differ from other productive processes in this respect, and the efficient operation of the pricing mechanism includes the economical allocation of resources to marketing employments. Thus the real and direct objectives for the marketing system is to provide for and participate in price formation, with the understanding that the pricing system will have as its prime functions the guiding of the flow of resources into production (including marketing) and of goods and services into consumption. If the marketing system is to be used for other purposes, such distortions as will be induced in the system and in the allocation of resources should be known.²

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¹ A paper prepared for the Agricultural Marketing Committee of the Social Science Research Council

² For a discussion of some of these, see O. H. Brownlee, "Marketing Research and Welfare Economics," this JOURNAL, Vol XXX, No. 1 (February, 1948), pp. 55-68.

If these are accepted as the general objectives for the marketing system, it is possible to indicate more specifically the objectives for marketing research. The following outline, while not all-inclusive, probably covers the major points:

1. To describe the organization and operation of the existing marketing system;
2. To determine the basic functions governing the production of the several marketing services;
3. To estimate the effects of changes in organization and operation on the physical inputs costs, and outputs (services) of the system;
4. To determine demands and preferences for marketing services (as distinct from demands for goods plus associated services),
5. To combine these into descriptions of new and more economical systems;
6. To contrast these results with the costs and prices characteristic of the existing marketing system in order to delineate sectors and areas where the process is inefficient and uneconomical,
7. For these problem areas, to study the marketing institutions in order to understand why and how they have led to distortions;
8. To recommend changes in the institutions that will achieve or at least encourage the desired adjustments; and
9. To test these recommendations by actual application.

The "Ideal" Market Concept

The objectives for the marketing system have been defined in terms of "efficiency" and "economy." These are, however, relative or comparative words. A marketing firm, function, or system cannot be judged as efficient or economical in any absolute sense, but only relative to alternatives or to some standard. Studies may be designed to show how the existing marketing methods could be improved, i.e., made more efficient and less costly. To be most useful, however, marketing research should be oriented with reference to some concept of an ideal or perfect market. Such a concept should make possible the most meaningful appraisal of the existing system, both in terms of delineation of problem areas and of indications of the magnitude and importance of the distortions. *At the same time it should provide a framework within which individual studies could be fitted, past work evaluated and integrated, and future research planned.*

What, then, can we use as a model of perfection? At least a partial answer is suggested by the above mentioned objectives for the marketing system, for they correspond in general to the results which would characterize an economy of perfect competition. For such an economy, economic theory describes an interdependent system

of pricing for factors of production, for goods, and for services. Within this system factors will be shifted among alternative employments in response to higher and more profitable returns. In turn, these returns will change and adjust with changes in technology and with shifts in consumer tastes and preferences. In equilibrium, costs of production (including the production of marketing services) will be at the minimum consistent with the *given conditions of resources technology, and demands*. Prices for goods and services will reflect and differ only by these production and marketing costs.³

Competitive economic theory can thus provide the framework for our ideal market. Confronted with any marketing and pricing problem, the research worker can plan his attack by asking himself such questions as "How would this marketing process be organized if it operated under the conditions of perfect competition?" This does not imply that competitive conditions could be completely attained, nor that the solution to marketing problems is simply a "return" to the system of free and perfect competition. A realistic view of the industrial economy of today indicates that it would be *both undesirable and impossible* to attain many of the characteristics of a competitive market. Two main types of modifications are necessary: first, the inclusion of welfare considerations that modify the distribution of income, such as progressive income taxes and minimum wages; and second, the possible advantages of a limited number of firms in those areas where economies of large-scale operation are important. In this last case, the significant questions are "What organization of this process would minimize costs and how can these costs be reflected in prices?"

Attempts to improve marketing by approximating competitive conditions will be appropriate in many instances. These include such things as curbing large-scale organization where its effects are primarily to exact charges not commensurate with costs, and perfecting knowledge through research, education, and market news. In certain other areas, however, this approach will not be productive and here the stress must be on approximating the *results* of competition in terms of costs and prices. As already mentioned, large-scale organization may frequently result from technological factors

³ These concepts are generally familiar to readers of this JOURNAL, so no attempt will be made to develop them in detail at this point. For a specific discussion of the perfect market in time, place, and form, see G. S. Shepherd, *Marketing Farm Products*, Iowa State College Press (1946), pp. 399-409.

that give rise to economies of scale, and the curbing or breaking up of such large units would necessarily lead to higher costs. This is a much more common situation in marketing than is sometimes supposed, for economies of scale are frequently of sufficient importance relative to the size of local markets to result either in (1) a considerable degree of local and spatial monopoly or (2) a number of small and highcost competing firms. In country marketing and processing plants, for example, this conflict is clear. The problem may be one of how to achieve and regulate low-cost monopolies in the public interest.

To conclude this section, the following list suggests some of the benefits that this ideal market concept can bring to marketing research.

1. It provides standards by which to judge the existing system by standards of *socially desirable results* or ends.⁴
2. The underlying principles are well developed and widely understood, and with careful thought they can be expanded to apply to such detailed problems as the organization and operation of local marketing facilities or to such broad issues as the allocation of resources among marketing and the other major sectors of the economy.
3. It stresses the importance of theorizing and logical analysis in the planning phases of research; *relationships are not determined by random gathering and tabulating of data*, but must be inserted as well-conceived hypotheses and then tested by carefully designed empirical studies.
4. By suggesting the general form for particular studies, it will help insure that the findings can be used in succeeding and more advanced studies. This should facilitate and promote effective integration of research and cooperation among research workers.
5. By stressing the important interrelationships and interdependencies in the workings of the economic system, the ideal market concept should encourage researchers to go beyond superficial and gross relationships. *The real market mechanism is complex, and some appreciation of these complexities is essential if research simplifications are not to destroy the usefulness of the estimates of basic relationships.*
6. Finally, by providing a "goal" that will frequently differ significantly from the *status quo*, the ideal market concept should encourage the exploring and developing of new areas of knowledge. Innovation is essential to progress and (research that contributes to progress is simply a scientific approach to innovation.)

⁴ This is not to deny that welfare considerations will sometimes define other results, as already mentioned, but in most instances, and particularly in the details of marketing research, the competitive model appears consistent with the general welfare in terms of results.

Suggestions for Future Marketing Research

The foregoing paragraphs have discussed the general objectives for the marketing system; some more detailed objectives for marketing research; and have advanced the concepts of perfect competition and of the ideal market as the logical framework within which to develop this research. The paragraphs that follow attempt to interpret these ideas in terms of several types of work. For obvious reasons this discussion must be brief, and emphasis will be on the nature and content of each field and the logical interrelations between the several fields. While dividing the work into a number of separate fields or categories seems desirable from the standpoint of exposition, these divisions are arbitrary and actual research projects will frequently fall into two or more fields.

Descriptions of the Present Marketing System

Marketing research has frequently been criticised on the grounds that its results are "descriptive," yet this cannot be a fault in itself. It may be true that some of the work has not progressed beyond description of an introductory or background character, or that the descriptions have been superficial or in other respects inadequate, but the fact remains that a clear picture of the organization and operation of the marketing system is essential to further progress. The general content of such studies will not be elaborated at this point, other than to stress the need for descriptions that will provide results useful in following phases of the work.

The Production of Marketing Services

If estimates are to be made of the inputs and costs that would characterize an ideal market or of the potential savings that would result from changes in the existing market, the fundamental relationships governing the production of marketing services must be known. In this phase of the research, it may be helpful to visualize the marketing system as a composite of two primary functions: (1) plant operations (including stores, warehouses, and processing plants); and (2) transportation operations involving the movement of products through space (including local assembly, inter-plant and inter-market transportation, and delivery). After studies have been completed for these functions, they should be combined into de-

scriptions of the marketing system as a whole under existing and alternative organizations. From the standpoint of the general objectives for the marketing system, as contrasted to the particular objectives for individual firms within the system, the ideal market involves the efficiency and economy of the entire process. This type of research should result in estimates of the effects of modifications and reorganizations of the marketing process on costs and services.

The Demands for Marketing Services

The definition of an ideal marketing system cannot be made on the basis of production efficiency and low costs alone, for the system is concerned with the production of those services that are wanted and demanded by consumers. Some changes in the marketing system, such as improvements in internal plant efficiencies, will tend to reduce marketing costs without changing the essential nature of the services provided. In many cases, however, changes in the system will be reflected in changes in the services and in the conditions surrounding these services.⁵

This field is almost unexplored, and it presents some very difficult problems for the research worker. The demands for products and for associated services are joint demands. Only limited alternatives with respect to services are actually available to consumers in most markets and for most products. In some cases the price differentials associated with alternative services are fixed through administrative controlled processes rather than through the free operation of the market. Some potential alternatives, and especially those that would be involved in important changes in the marketing process, are entirely unfamiliar to consumers. Furthermore, some of these alternatives are mutually exclusive so that it would be impossible for consumers to express their preferences through the usual operation of the market. In spite of these and other complications, information on consumer demands and preferences for services are essential if real improvements in marketing are to be achieved. The first and most difficult task in this field will be to devise satisfactory research methods and approaches.

The Delineation of Problem Areas

When fundamental studies of the production of and demand for marketing services have been completed, they may be combined and

⁵ Brownlee, *op. cit.*

synthesized into detailed and quantitative descriptions of ideal market organizations, and the ideals compared with the existing market and price structures, but it remains fundamental. These comparisons will provide meaningful measures of the efficiency of the present system in terms of the ratio of costs under the ideal system to costs under the existing system, and therefore will indicate both the direction of and the magnitude of desirable changes. Unless the research is brought to this point it cannot contribute greatly to the improvement of the marketing system, nor will it satisfy marketing researchers who have some sense of social obligation.

This approach of combining production and demand conditions to describe ideal marketing organizations is by no means the only method of delineating problem areas in marketing. Some problems are apparent on the basis of familiarity or inspection: congestion, duplication, and unutilized capacity in markets and marketing agencies are good examples. Others may be indicated by studies of non-competitive elements in the market; market sharing, discriminatory pricing, market domination and price leadership are obvious examples ⁶

One further approach should be mentioned here, since it may be very useful in indicating problem areas and directions of desirable change. An important and necessary condition for achieving the results of perfect competition and of the ideal market is that value of the marginal products for a given factor will be equal in the several alternative employments for, if any inequality exists, the social product could be increased by shifting resources from low to high yielding employments. With these conditions in mind, *it is possible to view the marketing system as an aggregate* and to compare the returns to resources with those in other sectors of the economy. This approach can be used to indicate sectors where certain resources are over- and under-supplied (where returns to the resources are abnormally low or high) and so to suggest desirable major adjustments in the economy.⁷ Needless to say, this aggregative approach could be applied to sub-divisions of the marketing sector.

⁶ See the writings of W. H. Nicholls, including "Reorientation of Agricultural Marketing and Price Research," this JOURNAL, Vol. XXX, No. 1 (February, 1948), pp. 48-54.

⁷ See T. W. Schultz, "Production and Welfare Objectives for American Agriculture," this JOURNAL, Vol. XXVIII, No. 2 (May, 1946), pp. 444-457.

Studies of Marketing Institutions

The research results at this point will delineate important departures between actual and ideal situations. They will give only partial indications of the causes of these departures, however, and very little information as to appropriate methods of improving the marketing system. Remembering that the ideal market concept is based on the assumptions of perfect competition, some probable causes include: (1) the lack of perfect knowledge by all parties, (2) lack of mobility of resources; and (3) elements of monopoly arising from size, location, or product and service differentiation. Each situation must be examined carefully to determine how such factors influence the market.

This should be accompanied by studies of the social, legal, and economic bases for the existing marketing institutions and of the probable effects of changes in these institutions. In this way it will be possible to select appropriate methods for modifying the marketing system along the indicated lines. In some cases these may involve governmental action in providing services such as market news and grading or inspection. In others the appropriate action may be legal proceedings under the Sherman Act in an effort to preserve competitive conditions. In still other cases, especially where dissolving large-scale marketing agencies would lead to higher costs and prices, public intervention in the form of control, regulation, and even ownership may be indicated.⁸ In any event, economists will require the assistance of other social scientists and lawyers in this phase of the work if the recommendations are to meet the double test of effectiveness in improving the marketing system and acceptability to the general public.

Testing the Results of Marketing Research

An essential part of scientific research is the testing of hypotheses prior to the drawing of general conclusions, but the nature of marketing research frequently places it in a peculiar position in this respect. While it is true that hypotheses will be made and in a sense tested through the procedures suggested above, the results must remain as tentative estimates of the effects of indicated changes on marketing costs and on prices. These estimates can be tested only

⁸ See F. V. Waugh, A. C. Hoffman, and Albert Meyers, "Agricultural Marketing Policy," a statement submitted to the Temporary National Economic Committee, February 21, 1941.

by actual application by sample firms or in sample markets. In short, final testing will represent the actual use of research results.

It may be argued that the jobs of disseminating research results and putting them into action should be carried on by marketing specialists in the Extension Service and in various Federal Agencies. But it is important that research workers follow the progress of the first stages of this action program and that studies be designed to check actual results against the research estimates. Such checks will permit an appraisal of the research methods and thereby lead to improved estimates and recommendations in future studies.

Integration with Other Fields of Economic Research

The above discussion has been limited almost entirely to the particular problems of marketing and of marketing research. The marketing and pricing system serves to tie together and integrate the whole economy, however, and marketing research can make a similar contribution to the general field of economic research. Studies of the allocation of resources within agriculture as well as between agriculture and other sectors of the economy, of inter-market prices, and of inter-regional and inter-enterprise competition involve the results of marketing research. Moreover, the basic concept of perfect competition can be applied to all of these problems and, with modifications such as have been noted, can provide a standard for the "ideal economy" that parallels the ideal market concept. The full development of this concept and its application to the important problems of the economy will require the coordination and integration of marketing research with the work in many other fields.

Conclusions

This discussion of marketing research has not developed new fields or drastic changes in approach and methodology. Rather it emphasizes the exploitation of existing methods and tools through a series of coordinated and integrated studies. While such ideas are not revolutionary, the fact remains that much of the research in this field in the past has not achieved such integration. Agricultural marketing research has resulted in many published studies in the period since World War I. In spite of this output, it is seldom possible to combine these into meaningful descriptions of the existing markets; of conditions that would characterize ideal markets; or to give solutions to pressing marketing problems. This does not imply

that the past work has been without value, but rather that potential values have not been fully realized.

The Reasearch and Marketing Act of 1946 serves to emphasize the importance of research integration, and to stress the need for carrying marketing research through to specific recommendations as to ways of improving the *system*. A program of research along the suggested lines should make a real contribution to this and to the general welfare. (It cannot be expected, however, to work miracles by providing a panacea for all of the ills of the economy¹)

DISCUSSION*

MAX E. BRUNK

Cornell University

Professor Bressler has well summarized the objectives for the marketing system. He has given us some specific objectives of marketing research and has indicated others in more general terms. In addition, he has at some length advocated the use of a budgetary or synthetic approach in the determination of unit costs under conditions of maximum efficiency. I agree with his conclusion that he has not developed new fields or suggested drastic changes in approach or methodology. His paper has stressed the need for integrating marketing studies, not only within agriculture but between agriculture and other segments of the economy, so that meaningful descriptions of and solutions for broad marketing problems can be made. Thus, his so-called "ideal market" would "provide a framework within which individual studies could be fitted, past work evaluated and integrated and future research planned."

The "ideal market," according to Professor Bressler, is not a completely satisfactory common denominator because it would be both undesirable and impossible of attainment. He suggests several modifications in keeping with welfare considerations and economies of scale. As for the latter, he is concerned with curbing the so-called evils of monopoly on the one hand while maintaining its benefits on the other. There is no evidence that such efforts to date have yielded anything to be desired in actual practice over the present marketing system. Although it is probably with the *results* of the ideal market that he is concerned, it seems to me that marketing specialists could for many years to come busy themselves with mental exercise in the development of the ideal market concept with its multiple theoretical modifications and still be far from the solution of current marketing problems. As for the need of a benchmark by which to measure accomplishment, it appears to me that the existing market supplies a more meaningful base. Such a base, of course, fails to indicate maximum possible achievement.

It is recognized that there has been some aimless accumulation of facts

* A discussion given at the Annual Meeting of the American Farm Economic Association, Green Lake, Wisconsin, September 15, 1948

without regard to some problem-solving activity. Nevertheless, for a number of years now, marketing researchers have been obtaining facts based on well formulated hypotheses which serve to modify some of the basic assumptions behind the ideal market concept. If we must continue to ignore these modifications and return to a static ideal market concept for a framework within which to fit our studies, evaluate past work and plan future work, we can hope to make little progress. This does not deny the importance of competitive economic theory in the formulation and constant improvement of basic concepts, but it does seem to censure researchers for not having used theory in the development of concept modifications in the light of facts which have been thus far developed. Science progresses only to the extent that new hypotheses are developed from the testing of old hypotheses. We cannot expect to make much progress by continually basing our research on concepts which fail to grow. Needless to say, our marketing system today bears little semblance to that envisioned by classical economists.

Not many researchers in marketing can spend their time developing "panaceas for all the ills of the economy," or in devoting their efforts to assembling input-output data into ideal functions without having an eye to practical application by making the necessary modifications resulting from testing under applied conditions. Perhaps Professor Bressler would agree but he has not so indicated in his paper. Most researchers are confronted with the pressing problems which have evolved themselves from previous research. Such studies deal with ever decreasing sectors of the marketing system. More fruitful research will come as more of us become resigned to work on the menial problems, each of which will contribute its part to over-all marketing efficiency.

The field of marketing research, like that of production, requires an ever increasing degree of specialization which will continually add to the problem of integrating marketing studies into new and meaningful descriptions. In the development of both knowledge and basic assumptions, the importance of such integration cannot be denied. Professor Bressler has done an excellent job in making this problem clear. However, it should be recognized that this problem alone constitutes only part of the over-all objectives for marketing research.

DISCUSSION*

L. H. SIMERL

The topic assigned to Dr. Bressler, namely "Agricultural Marketing Research," is so broad that it permits, in fact requires, much selection in the material to be presented. He chose to describe, in proper academic phraseology, the major theoretical goals of the marketing system and the theoretical objectives of marketing research. No doubt this kind of work is of great importance, but I regret that Dr. Bressler did not illustrate his points with specific examples and suggest some definite commodity problems for investigation.

* A discussion at the Annual Meeting of the American Farm Economic Association, Green Lake, Wisconsin, September 15, 1948.

One might question the assumption that our enterprise is predominantly free. Certainly there are very large areas of our economy where prices do not perform the function of guiding production. Consider, for example, all services performed by federal, state, and local governments, and by industries whose prices or charges are set by federal, state, or local governmental agencies. All together those may include nearly half of all goods and services produced.

The references to price flexibility suggest many interesting points. Compared with prices of most other commodities, prices of agricultural products are remarkably sensitive to changes in supply and demand conditions. Of course we must admit that various governmental policies and programs tend to prevent some desirable adjustments. However, in most instances our agricultural marketing system provides a great flexibility in prices *paid to farmers*. Thus market prices for grain are adjusted to supply demand conditions each day. Prices offered to farmers for livestock, poultry, and eggs respond to day-to-day price-making influences. Butter-fat prices are changed daily, or every few days. Whole milk price schedules are adjusted monthly. Prices for most fresh fruits and vegetables are established daily or hourly in farmers' markets. In fact, there are some grounds for arguing that prices paid to farmers often are too flexible, too responsive to changes in supplies and consumer demand.

A highly contrasting situation appears to prevail in many retail markets. All too often retail prices do not reflect changes in prices paid to farmers. This is one of the points upon which we need a lot of research.

This problem may become increasingly acute in the relatively near future. Marketing margins have increased very sharply since 1940. As consumer demand declines, sales will tend to be reduced. At the same time there will be sharp reductions in prices paid to farmers in order to maintain the large margins that have been built into the marketing system during the past eight years. This in turn will bring down a lot of criticism upon "middlemen." Farmers, of course, will be glad to have the blame for the relatively high retail prices directed toward another group, but they will not like the very low farm prices that may accompany such a situation.

The problem of inflexibility in margins has two aspects. One requires ways and means of reducing over-all distribution costs in a period of declining demand. The other calls for methods of securing more flexibility in marketing margins for individual products.

Considerable study has been given to reducing marketing costs, and I suppose that this will be a perpetual problem as long as our economy continues to make progress. In contrast, I believe that relatively little has been done to reveal the relationships, or lack of them, between short-time fluctuations in retail and farm prices of individual products.

This brings up another point. It is that many of the really basic facts about marketing can be discovered only with the cooperation of many individuals and firms whose interests may be jeopardized by the facts that research will reveal. This situation has greatly retarded basic market research in the past. It will provide some of the most difficult problems in the future.

DISCUSSION*

E. W. GAUMNITZ

National Cheese Institute

Agricultural marketing research has come in for increasing attention during the past few years. This interest represents a renewal of the interest exhibited in the twenties. While it is unnecessary to comment on the reasons for the renewed interest—this having been well reviewed by Dr. Black, among others, at the meeting of this group a year ago—it perhaps is worthwhile to note that interest in marketing research occurs periodically but always seems to represent a single point of view, namely, that of increasing returns to producers of agricultural products. (No doubt, in a general sense, the objective can be considered as that of increasing producer returns or reducing consumer prices and narrowing handler margins.)

Dr. Bressler has outlined objectives for the marketing system and for marketing research in terms of "social objectives." Presumably what is stated with reference to social objectives can also be applied in general to research from an institutional or competitive point of view.

The general objectives of agricultural marketing research, as stated by Dr. Bressler, increased efficiency or an efficient marketing system, seem to be well outlined. The specific problem is, of course, that of bringing about these end results.

At the outset it is apparent that certain types of research are relatively easily outlined and the results easily evaluated. Likewise, these are the problems which are more easily attacked. They were the problems, which most of the Advisory Committees, established under the Research and Marketing Act, have advocated as subjects for research. In the dairy field these include such problems as costs and margins, utilization, seasonality of production and marketing, consumption, methods of price determination and the effects of government regulations. These are the problems which we all recognize as being significant. No one can argue about the desirability of a better package for cheese or the advantage and convenience of a quick frozen vegetable.

The problems which are more difficult and those for which the outline of attack is not so simple are those concerned with the utilization of the entire marketing system and the changes, which need to be instituted, to result in the supplying of a more desirable product at the same or a lower price, or supplying of the same product at lower prices.

Involved in this problem is that of attempting to evaluate or appraise the present system and to outline the changes which can be instituted within our general frame of government.

I have only two or three comments to make on Dr. Bressler's paper. As he has defined them, I have nothing to add to his statement of objectives, either general or specific. I would like, however, to comment on two or three things which have a bearing on his general statements.

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(1) I agree that much remains to be done in the field of descriptive marketing. The principal criticism of such work is that it has not been fully descriptive. My criticism, objection, or suggestion with reference to description studies would be answered were such descriptions made in the light of a well developed concept of an ideal market. It appears that much of the work which is done under the heading of "Marketing Research" would be better placed were it focused against the background of an over-all theoretical study of an ideal market. Description, in this event, would be more specific and go into greater detail with reverence to the deviations from the ideal concept. Specific detailed studies can then be made of portions of the overall mechanism. Such studies then lend themselves to answering particular questions. In the absence of an over-all concept the analysis of specific or small problems becomes lost in the maze. What I am trying to say is that the over-all or broad concept needs to be set forth first and the specific or detailed studies should follow. The difficulty has been that the over-all is not seen in its proper perspective, in which event the specific makes no sense.

(2) Seemingly, it is commonly assumed that basic data are readily available. This, it seems to me, is one of the fundamental difficulties with all research. The fact of the matter is that we only have available certain statistical information, the accuracy of which at times may well be questioned, and certainly we have very little basic data with reference to the factors which influence particular business decisions. My point is that figures, as such, may be indicators of results but may throw very little light on the causes.

(3) Generally speaking it may be apparent that certain modifications of the marketing system would result in efficiencies. No doubt, all of us have in mind modifications which, if made effective, would result in lower prices to consumers. The problem of stating unequivocally such conclusions and of presenting supporting evidence is quite a different matter. Until some method is devised, under which conclusions are set forth impartially by reputable institutions, it would appear that advantage will not be taken of results that are known.

ROUNDTABLE ON COOPERATION

Chairman: Harold Hedges, Farm Credit Administration

UNSETTLED QUESTIONS RELATING TO AGRICULTURAL COOPERATION*

J. K. STERN

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I PREFER to emphasize the principles and practices of farmer cooperatives on which there is general agreement, but the subject assigned to me for this paper does not permit that approach. As few of us like criticism even when it is intended to be constructive, it is likely that some of my friends will consider this as wasted effort. Then too there is the doubtful procedure of raising questions and not having time to attempt to answer any of them. I hope that my colleagues on this panel will be able to supply the needed balance.

Cooperative organizations of farmers are relatively new in the United States. While the Grange and other farmer movements spawned a great many of them in the last quarter of the nineteenth century, most of our existing cooperatives are less than 40 years old. It need not surprise us then when we discover that there are about as many ideas concerning how a cooperative should operate as there are cooperatives. There is no complete agreement among our best cooperative leaders nor among our best economists today concerning a number of issues relating to agricultural cooperation.

We are not even in agreement on what a true cooperative is nor on what its objectives should be, and if we do not know where we want to go, how will we know when we have arrived at our destination? Let's look at the record:

W. E. Paulson of Texas A. & M. in addressing this meeting in 1940, concluded with a definition:

"Cooperation is individualism expressing itself in associated action. Cooperation is founded on self-help with a minimum of governmental participation. Cooperation recognizes private property as fundamental in a society of free men. Cooperation helps to preserve the institution of private property by making it universal. Cooperation brings democracy into business through the one-man-one-vote principle in contrast with the aristo-

* A paper given at the Annual Meeting of the American Farm Economic Association, Green Lake, Wisconsin, September 15, 1948.

cratic tendencies of the private corporation with its share-voting of a concentrated ownership of stock. Cooperation refuses to recognize profits as the motivating force in industry. Cooperation operates to serve its members at the lowest possible cost and not for profits on its investment. Cooperation puts its faith in abundance and low prices in that service, not profits, is its objective. Cooperation supports the competitive system—competition between efficiently operated cooperatives and private concerns. Cooperation eliminates speculation in equities because stock in successful cooperatives cannot have a value above par. Cooperation makes its members an articulate part of the economic system in which they live. Finally, in the words of the great English economist, Alfred Marshall, in his presidential address to the Cooperative Congress in 1889, cooperation is 'at once a strong and calm and wise business, and a strong and fervent and proselytizing faith'."

While I agree with part of his definition and description, I cannot agree with all of it. "Profits" to the members may not be the motivating force in all cooperatives but they are in all that I have ever worked with.

A resolution adopted by the National Council of Farmer Cooperatives in its annual meeting in 1947 stated:

"Be it resolved that this organization vigorously express its deep belief in the profit motive and its free play as being a basic force which can maintain permanently a great and prosperous nation."

A statement I like was made by E. Fred Koller at this meeting last year when in discussing the place of cooperatives in a capitalistic economy he said:

"Thus we see that cooperatives provide a means of complementing and strengthening the capitalistic economy at its weakest points. While cooperation is clearly not a panacea for all the ills of capitalism, it does perform a positive role in the free enterprise economy by aiding it to achieve a better allocation of resources, higher total production and wider distribution of income. The ameliorating influence of cooperatives in our economy is particularly vital in these days when the free enterprise system is being challenged by the sanguine promises of state-controlled economies that now prevail over so much of the world "

A statement by H. E. Babcock in the February, 1935, issue of the *JOURNAL OF FARM ECONOMICS* reads:

"One point which my ideal farmer-owned, farmer-controlled cooperative will always bear in mind is that the cooperative is not an end in itself, but a means to an end. The real end is the improvement of the economic positions of the individual members, without leveling them off or averaging them down."

Many people accept this definition but others would broaden it. It is now twenty-five years since Bernard Baruch wrote:

"The cooperative plan was evolved in an attempt to restore the fair economic relationship which should and once did prevail, between on the one hand, those who produced from the mine and factory, and on the other hand those who produced from the soil. Although agriculture is the oldest and best known business, with certain elements in it exactly like those of any other, it has stood still while younger industries have applied modern methods of control of direction and have gained a disproportionate share of the profits therefrom. Linked with the other elements necessary to success for cooperatives is this consideration: groups cannot live for themselves alone. They have public obligations and relationships to fulfill and sound attitudes to assume on those questions which promote social unrest before they can be sure of permanent foundation. For example, where a cooperative is in a position to dominate the price of its commodity, that price must be fair, a gouging price would strike at the very object of 'live and let live' which is the fundamental impulse of collective farm produce selling. I would counsel the cooperatives, their leaders and their members always to remember that they can never rise superior to the immutable law of supply and demand, which is the unshakable basis of the structure of commerce."

Mr. Baruch would broaden the objective of cooperatives to include the interest of the public in its operations.

Few would deny that in the "Sapiro" days some cooperatives attempted to get monopoly control of certain farm products. Is the anti-monopoly attitude of most cooperative leaders today an acceptance of the fact that it is impossible for a farmer cooperative to gain monopoly control of a product, or is it a recognition of the fact that such control if possible, would not be in the interest of the members or the public?

In speaking before the American Institute of Cooperation Annual Meeting in 1941, Homer Brinkley, general manager of the American Rice Growers Cooperative Association said.

"In our opinion it is now generally recognized that only government can exercise the broad-scale controls necessary for the stabilization of agriculture as a whole. Cooperative effort is by its very nature totally unsuited to such an endeavor. The wrecks of farmers' associations which in past years tried their hands at price fixing, production control and such related endeavors is ample evidence to all concerned that such a program applied to agriculture as a whole by cooperatives would be a dismal failure."

If, however, we were to carry public interest far enough, we would have to ask how co-op leaders who ask for support prices, marketing

agreements and tariff restrictions, would demonstrate that they are in the public interest. Possibly there is a difference between the short time and long time point of view on some of these issues.

Another question might be raised concerning the aggressiveness of mature cooperatives. Generally speaking, young organizations are more "radical" or aggressive than mature cooperatives. We are now in a generation of mature cooperatives for the first time. Is there danger of their becoming too conservative and interested in maintaining the status quo? For example, are the milk bargaining co-ops just as much interested in narrowing dealers' margins as they once were or has their dependency on state and federal orders changed their point of view?

History indicates that cooperative competition in some other countries has been far more successful in holding in check or in eliminating cartels and monopolies, than has any act of government legislation. If this is to be our policy then our cooperatives as they expand and acquire more facilities, with more people assuming the risk of the entrepreneur, will need to be careful that they ask only equal treatment before the law. Legal barriers in industry are also legal barriers to cooperatives. The question as to whether farmer cooperatives today have any special privileges not given other types of business should be adequately answered so that the public will know the facts.

Do the objectives of cooperatives go beyond the consideration of economic need?

At the 1946 Annual Meeting of the American Institute of Cooperation, M. G. Mann, manager of the Farmers Cooperative Exchange, stated:

"It is my opinion that unless we place just as much emphasis on our educational and membership relations projects as we do on our economic projects, we will lose sight of the true value of cooperation. If this happens, the cooperative movement will eventually turn out to be nothing more than just another way of doing business."

There may be differing points of view here depending upon whether this is part of the "end" or a practical "means" toward the end. Unless the public recognizes that cooperatives do serve in its interest, the climate for cooperatives may become uninhabitable.

Frank Robotka said to the same group in 1946.

"Cooperation cannot rise above the average level of the understanding and self discipline of the people. We in this country have been too much

concerned about building cooperative organizations and too little concerned about developing the capacity of people to cooperate—that is, *building cooperators.*”

For twenty-five years economists have advised cooperatives to specialize along commodity lines. Have we changed our thinking today or are we out of step? The country store a generation ago stocked everything for everybody and had to give way to streamlined grocery, drug, and hardware stores, and the early co-ops which handled everything were replaced by specialized commodity cooperatives. Today the swing is reversed again and co-op community services which handle farm supplies, service farm equipment, and market farm products, are replacing the specialized local co-op unit. Will modern accounting methods, and good management keep them from avoiding the pitfalls of an earlier generation? Perhaps the G.L.F. system of offering multiple services at one point, but with each group of services under different management, is the answer. If this is carrying out the will of the members then why do some cooperatives stand pat while others change their policies and programs?

Where do we reach the point of diminishing returns on vertical and horizontal integration? Petroleum cooperatives have found it necessary to own their own oil wells, pipe lines, refineries, and retail distribution systems. Cooperatives operating canneries for many farm products today are facing the problem of how to keep their products identified and still get them on the shelves of the corner grocery store. Should farmers operate chains of retail grocery stores in order to have an outlet for their products? Some cooperatives have found and developed foreign markets for their products. What machinery, wholesale and retail, is needed to most efficiently handle such operations?

What should the capital structure of a true cooperative be? Is the revolving capital plan the ideal one or are other plans for handling capital equally practical and cooperative in nature? This question is becoming more important due to the increased investments of members in their expanding services.

Is competition between cooperatives sound and can a satisfactory explanation be made to members and the public?

In the July 1931 issue of this JOURNAL, H. E. Babcock wrote:

“The meanest competition in the world is that between cooperatives.

No cooperative wholesale purchasing service buying for a region can hope to succeed if within that region are other cooperatives trying to do the same job."

If this be true there is "mean" competition in many parts of the United States today. There always was competition between local cooperatives and regional cooperatives, but competition between regionals is relatively new and it is increasing. Will members force some combinations in the interest of efficiency, will competition become costly to the members who finance it, will "personalities" or "service" win out?

Why are not farm people of all ages more informed and interested in the cooperatives that have served them well? Frequently comparisons are made with Danish farmers who almost universally support their cooperatives. In speaking with reference to this issue, Frank Robotka in 1947 stated:

"It has been said that the Danes have a peculiar talent for cooperation. Cooperation is not a racial characteristic. It is a mode of behavior that is learned—hence teachable."

How then can it best be taught and should we try to teach the adult generation today or their sons and daughters? Should cooperation be included in text books at all levels of education as "a" way of doing business—should organizations conduct schools of their own as some of the regionals now are doing, should the co-ops within an area work together on an educational program with vocational high schools as they have done in California and in Wisconsin, should we have American "folk schools," or neighborhood study clubs as they do in Ohio, or should a state association of cooperatives attempt the job as they do in Michigan? Perhaps a sound program would include all of these. Or can you depend on an efficient commodity service doing the job over a period of years without any particular educational program labeled as such? How does doing business with non-members, or the trend in regional purchasing cooperatives to appoint commercial feed dealers as local agents, affect an educational program?

Is it important that the next generation of cooperators be well informed concerning the heritage that is handed to them, and their opportunity and responsibility to carry on? Is teaching farmers how to help themselves less important than a good commodity service? If so, are we training for this responsibility?

Are our regional cooperatives the living examples of democracy that we tell the public they are? John Daniels in concluding his book on American Cooperatives says this:

"Co-ops are not doing so well democratically as they are economically. Indeed—speaking now of their regional and national business organizations—there is an evident rush-and-race to pile up volume and go as fast and far as possible, with more than a willingness, almost a compulsion, to short-circuit democratic processes for speed, efficiency and material results."

Is this true, and if it is what are the implications for the future of cooperatives?

How can you measure the success of a cooperative program? Do you look at the volume of business, the number of members, the net worth, the net margin in comparison with other similar enterprises, improvement in quality of the product, the opening up of new markets, expansion of facilities, the percentage of the consumer price the farmer receives, the cost of feed per dozen of eggs, or per hundredweight of milk, the standard of living of members compared with other groups in our society?

Is the type of services unlimited in which cooperatives may successfully engage? Can they successfully tackle the problem of rural housing? Surely there is a need for it. If they should build tractors why not farm trucks? What is the limiting factor, capital, or volume of business, or trained personnel or something else? What guides can be used in determining this?

Should farmer co-ops keep separate and distinct from city co-ops? Usually they are organized under different laws and frequently they have different objectives. Farm co-ops usually market farm products and purchase supplies used in production. The members' welfare is frequently tied closely to that of the cooperative. City co-ops usually handle consumption items such as groceries, and their own economic status is not closely tied to the success of the cooperative. Should farm co-ops also purchase for members their groceries, carpet sweepers, and washing machines? There are some instances where producers and consumers have worked together amiably, but leaders generally recommend separate and distinct co-ops for farm and city, regardless of whether or not they may want to work together.

Obviously there are many unsettled questions relating to agricultural cooperation, ranging from differences of opinion on ob-

jectives down to actual management details. How then can we as agricultural economists make a contribution toward their solution? Surely we have a responsibility in the field of research. While the pressure is on most of the time to do applied research and service work, there is a basic need for fundamental research in this field.

The problems in marketing and purchasing and in business management will probably receive enough attention, particularly those that apply to cooperatives and commercial business alike, but what of the problems that are peculiar to cooperatives alone? These include the economic, the institutional, the legal, the educational, and the human problems. There is a lot of uncharted territory in these areas of thinking and action as they are related to cooperatives.

Most, if not all of us, would agree that cooperatives are a very necessary part of our capitalistic economy. Personally I believe that cooperatives are as necessary to guarantee the perpetuation of our capitalistic economy as are two strong political parties necessary to perpetuate our American system of democracy.

In the years ahead our research work and our educational efforts must help to determine how this cooperative method of doing business should and will fit into our capitalistic economy, how cooperatives can contribute most in bringing economies into production, marketing and distribution, to the end not only of bringing about a more permanently prosperous agriculture, and a more stable industry, but all of this must be in the public interest as well. This is a real challenge to all of us.

DISCUSSION*

FRANK ROBOTKA

Iowa State College

If Professor Stern's purpose was to stress the need of more and better research and education in the field of agricultural co-operation, few will probably take issue with him.¹ In his revised paper he concedes that there are considerable areas of general agreement. He then devotes about half his paper to a discussion of the views of various people in support of his contention that a lack of "complete" agreement exists regarding a number of questions, mostly concerning the aims and objectives of co-operatives. In the remainder of his paper he raises a number of additional questions.

* A discussion at the Annual Meeting of the American Farm Economic Association, Green Lake, Wisconsin, September 15, 1948.

¹ See "Research and the Future of Cooperation" by the writer, *American Co-operation*, 1946.)

Although there is ample evidence of lack of agreement, many will question Professor Stern's choice of some of his "authorities." The writer believes that there is less disagreement regarding fundamentals than is generally supposed, at least among recognized students in the vanguard of co-operative thought. It must be recognized that, although many have contributed to the subject, few have done much penetrating analytical work on the basic economic aspects of co-operation. The views of some of the most prominent of these were not cited.

Granted that there may not be complete agreement among the economists, it is to be expected that there would be even less agreement between the economists and the practical co-operators, because whereas economists consider the longer-run social interest, the co-operators, like other businessmen, consider the more immediate entrepreneurial interest.

A question may be raised as to whether a distinction *with a difference* does not exist between "unsettled questions" and "unsolved problems," that is, problems unsolved in the sense that, although substantial agreement may exist as to underlying theory, problems arise in efforts to apply the theory in practice. It would have been interesting if Professor Stern had undertaken to separate the unsettled questions in theory from the unsolved problems in practice. Most of the questions raised in his paper appear to be unsolved problems in practice.

Even though a question may be settled in theory, practical functioning in a dynamic environment involves a continuous process of adaptation and readaptation. No adaptation is likely to be perfect at a given time or continue to be the best adaptation for long. Hence the best we can hope for is not complete solutions of problems but progress and improvement with respect to them.

It is well that Professor Stern mentioned the need of emphasis on problems which are peculiar to co-operatives as a distinctive type of business organization. This part of the paper might well have been amplified, because these distinctive problems have and are likely to continue to receive less research and educational emphasis than they merit.

I also endorse his implied suggestion that we economists who are working in this field need to integrate our thinking. Thus far, we have been working altogether too much in isolation. The efforts of the American Institute of Co-operation to break down this isolation through the workshop sessions held the past two years are to be commended. Many readers will be interested to know that tentative plans contemplate a two-week seminar on the more fundamental economic aspects of agricultural co-operation preceding the 1949 session of the American Institute of Co-operation to be held at Madison, Wisconsin. The seminar or work shop as a "sweating out" process should contribute greatly to a clarification and crystallization of co-operative ideas in the present stage of their development.

Urgent as the need is for economists working in this field to integrate their thinking, there is also a need for the economists to integrate their thinking with that of workers in sociology, law, political science, etc., and, what is equally important, with that of practical co-operators. A two-way

channel of communication and intercourse between co-operators and workers in the social sciences needs to be kept open and functioning effectively.

Problem Areas. A large percentage of the questions raised by Stern and those he cites relate directly or indirectly to the aims and objectives of agricultural co-operatives. Does this emphasis on aims and objectives reflect the relative importance which Stern attaches to this particular problem area?

Bulletin 15, "Research in Agricultural Co-operation—Scope and Method," by the Social Science Research Council lists 80 research projects classified under 12 headings each relating to a more or less distinct problem area. Although a few of Stern's questions fall into problem areas other than aims and objectives, no questions falling into many of them are raised.

The writer has found it useful to outline the important purposes that research in this field may serve. Among the 15 purposes tentatively outlined, those most neglected appear to the writer to be:

1. To provide a better basis for public policy determination
2. To bring legal and economic concepts relating to co-operation into closer consistency. (See "Lego-Economic Implications of Co-operation," by the writer, *American Co-operation*, 1946).
3. To provide better tools and criteria for the economic analysis of co-operative problems and for the measurement of co-operative success, of true co-operation, and of the contribution of co-operation to general welfare. (This general purpose has to do essentially with the economic nature of a co-operative as a distinctive form of business organization and its economic role in the economy. It seeks to bridge the gap between co-operation in practice and economic theory.)
4. To provide better materials for the teaching of co-operation on both undergraduate and graduate levels.

Professor Stern properly emphasizes some of the new questions and problems which have arisen as a result of current trends and developments in co-operation, such as the increasing scale of operations, the entrance of co-operatives into new fields of activity, the increasing concentration of power in some co-operatives, the development of integrated co-operative systems of marketing, and so on. These developments not only raise new questions and problems but in many cases give new or added significance to old ones.

What activities are suited to co-operation and what factors control? We are, of course, co-operating successfully in many areas of activity today that were regarded as unsuited to co-operation years ago. This trend will no doubt continue. At a given time, the limits will probably be set primarily by the urgency of the need, the ability of the people concerned to contribute the necessary capital, leadership and management and their ability and willingness to assume the risks involved. The significance of these factors is undoubtedly changing with time. Research and education certainly has an important opportunity as well as an obligation to throw light on this important question.

UNSETTLED QUESTIONS RELATING TO COOPERATIVES AND COOPERATION*

ORION ULREY

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MR. STERN has raised many significant questions regarding cooperatives and cooperation. Each of the 16 or so unsettled questions he raised merit considerable scrutiny, both by economists and by cooperators. His paper raises the question of terminology which is used in discussing cooperatives. Terms such as: profits, capitalism, competition and cooperation seem to carry a variety of meanings.

Should the term "profits" be restricted to earnings on invested capital, or should it include all of the self-gain economic motives such as savings, services and wages? What is capitalism today? How much stateism, private economic concentration and voluntary groupism is included in 1948 capitalism? Does competition apply only to the market where there is a host of sellers and buyers? Or can we also use the term "competition" to describe the action of large economic groups for self-gain? What is the name of the condition where there is only one seller and that a cooperative? Should the term "cooperation" be applied to a farmer's business organization where it is the only processor and the only merchandiser in the wholesale field?

My few remarks will be devoted to discussing one group of unsolved questions. What is a cooperative? How define a cooperative? How study a cooperative and cooperation?

Many of the roots of the business cooperative go back only a century. The environment in which the cooperative has been maturing has been constantly changing. The literature indicates a wide difference of opinion concerning what it is. During the last half of the past century students attempted to describe and define it in terms of the total society. Recently more attention has been given to the functioning of farmers' business organizations. Perhaps it is time that we attempt a more thorough analysis of the cooperative and cooperation. A few questions and suggestions are offered.

1. What are the principles of cooperation? There is a wide differ-

* A paper given at the Annual Meeting of the American Farm Economic Association, Green Lake, Wisconsin, September 15, 1948.

ence of opinion. A few months ago, I examined 14 books to find out what they thought the Rochdale principles were. There were 14 different combinations of principles and business practices listed. As all students of cooperation know, the Rochdale Pioneers never recorded any body of principles. There are no Rochdale principles.

2. What are the business and community practices that distinguish a cooperative from other business? Is the cooperative by its nature any different from a proprietorship in credit, price and service policies and practices? Are the relations with members and patrons the only type of cooperative practices which are different from other business?

3. Is the cooperative only a business institution to be measured in terms of productivity and income? Should the effects upon individual members, families, and communities be included? If so, how important are the latter?

4. What are the objectives of a cooperative? Is it price gain, protection of the democratic-capitalistic system? Perhaps these are only means. If so, we should be looking deeper into human motives and especially into that somewhat intangible objective, the growth of human personality. Is the farmer member basically concerned with protecting the family farm, capitalism or even his proprietorship? Fundamentally, he may be most concerned with expressing, protecting and maturing his individualism.

5. How describe the cooperative in terms of capitalism and socialism? The cooperators are loudly maintaining that the cooperative is an institution of capitalism. What is capitalism? What is socialism? We have a mixed system—many types of capitalistic institutions, and many types of state organizations and programs. Under each system both individualism and groupism are emphasized. The cooperatives usually represent voluntary groupism and the state usually compulsory groupism. Many farmers, however, have only one choice, that of selling to or through a cooperative.

6. Is the cooperative to be considered only as a competitive institution? If it is only a means to obtain economic efficiency, it could operate either as one of the market competitors or as the only processor and distributor in a market or for a commodity. In the latter situation, the competition would be among the economic groups.

7. What is the relation of cooperative to democracy? But what is democracy? Does democracy apply only to the political field, or

also to the economic, social and religious areas? Democracy is some sort of a compromise between the individual and the group. So is a cooperative and so is cooperation. Cooperation emphasizes voluntary group effort, a high type of human activity. The cooperatives may have a function to perform in maintaining a favorable balance between individualism and groupism—the foundation of democracy in all areas of life.

8. What is the relation of the cooperative to the environment? In what sort of setting does the cooperative survive and grow? How does the cooperative affect the environment over a period of decades and centuries? By environment we include stage in the scientific revolution, development of educational processes, and the ideologies and beliefs of the people. The scientific revolution has brought urbanization, concentration, monopoly, centralized control, national economic groups, few managers and many workers, and national interdependence. The revolution has also brought education, leisure, longer life, more possibilities for satisfaction, and hope for the good life. The cooperatives have had their great growth during the past century, a period of considerable freedom for business and hope for man. Today, we are again threatened with centralized restrictions.

These suggestions by no means cover all factors which, in my opinion, should be included in a thorough study of what is a cooperative and what is cooperation. I believe all of the social scientists are needed to prepare an adequate answer to the questions raised.

We will raise a final question: Is the nonprofit nature of a cooperative an adequate reason for the majority of citizens for the exemption of cooperatives from income taxes? Perhaps there are other significant reasons for distinguishing the cooperative, the nonprofit and the mutual businesses from the usual proprietorship and corporation businesses.

MEMBERSHIP AND PUBLIC RELATIONS IN AGRICULTURAL COOPERATIVES*

GEO. W. RUPPLE

Consolidated Badger Cooperative

THE extreme complexity of agricultural cooperatives relating to State and Federal laws, financial obligations, patronage refunds, organization policies, social and economic relationship and the continued maintenance of the cooperative position in business today offers unlimited subject matter for educational work in membership and public relations.

Cooperatives in the past and present have developed and are continuing to be motivated because of their economic benefits to members rather than the services rendered and their pace-setting effect influencing prices and production.

Today it behooves all cooperative organizations to employ personnel that have the educational background and capacity to develop cooperative minded leaders and members. The process of educating membership must be developed through various methods and media properly designed solely for this purpose. It is becoming more necessary each year to educate the membership to the numerous advantages, other than economic, that good cooperatives provide their members.

Methods used by successful cooperatives to disseminate information to members in the past have been successful in educating a certain percentage of the membership. The number of cooperative-wise and informed members have served the cooperatives well in advocating and encouraging such necessary measures as diversified facilities, market expansion and increased membership. It is questionable how long cooperatives can continue to prosper without developing a greater percentage of informed members.

Methods now used by a number of cooperatives for the purpose of developing membership relations, I believe, can be renovated to do a better job of accomplishing their purposes. (1) Cooperative papers and periodicals can be better planned and more attractively designed, with greater emphasis on the selection of informational material. (2) Membership meetings designed to present more general cooperative information rather than information based entirely on the local cooperative. (3) A better trained and informed employee personnel should be developed. (4) A youth program

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designed to educate young people on the value of cooperatives and designed to get participation in actual cooperative enterprises. (5) Make educational material available for schools and Universities. (6) Educational clinics in which leaders discuss cooperative procedures with members and others. (7) Use visual aids more extensively among members.

Cooperatives generally have been slow to develop proper public attitudes by which public acceptance to their methods and ideals of doing business is at the best. *Not only have cooperatives been slow in this matter but in addition most have failed to maintain a constant continuous program, the usual method being to periodically or on a crisis basis, blast the public with the crucial problem of current interest.* This fails to get the desired results because the public mind has not been conditioned by previous constant preparatory information to accept facts as truth from cooperative sources.

Propaganda in the form of anti-cooperative radio broadcasts and anti-cooperative literature has been cleverly circulated by pressure groups. *Cooperatives have an important job to do in retarding and debunking this unfair propaganda.* A public relations program designed to do this job should be in progress in all cooperatives. Cooperatives cannot depend entirely on educational organizations to do this job, nor can they expect to do it properly without considerable expenditures of time and money.

This problem can best be solved by a combination of oral and printed information properly distributed. Newspaper advertising, news stories, press releases, pamphlets and bulletins are important media when properly used. Radio programs cleverly designed will *aid the progress of a public relations program.* Every cooperative should have a definite program of presenting information to employees and membership for the purpose of public relations. If every cooperative will strive to take care of local obligations in a well planned public relations program, results generally will be forthcoming. Cooperative leaders and management must stop assuming that the rank and file of independent businessmen and others understand cooperatives. Few people realize what cooperatives have done to benefit the general public in the form of reasonable prices, quality products, production, and allocation of resources. It appears that if all cooperatives develop a good local public relations program first, much will be accomplished to improve the cooperative position in the public eye.

ROUNDTABLE ON SIZE OF FARMS

Chairman: Frank J. Welch, Mississippi State College

THE SIZE OF FARM IN THE SOUTH*

D. GRAY MILEY

Mississippi State College

THE agricultural economy of the Southern States has been dominated for many years by the production of cotton, which is a crop that requires large amounts of hand labor. The heavy labor requirements at chopping and picking time have been a major factor in determining the size of the operating unit. The size of the unit has been fixed to a very large extent by the acres of cotton that a farmer and his family could chop and pick. The average farm family can handle from 8 to 12 acres of cotton. However, in order to plant and cultivate the cotton, the farmer has to have a mule and the necessary one-mule equipment. This means that he has to produce enough corn to feed the mule that he has to have to produce his cotton.

With this type of farming pattern the cultivated land per farm family averages 25 to 30 acres in most cotton areas in the South. In addition, the farmer has an equal amount of non-cropland. This does not represent the size of the ownership units, but it is the acres of cultivated land available to the average farm operator, whether he be owner, renter, or sharecropper. There is a tendency for the size of the operating unit to be about the same, regardless of the size of the ownership unit; that is, if a farmer owns more land than one family can handle, he usually adds one or more families until the size of the operating unit for each family falls within the range of 25 to 30 acres of cropland. In reality many farmers that own sufficient land to operate a large efficient unit are at present operating in such a fashion that their one farm actually amounts to two or more one-horse farms under one management. The system is such that each sharecropper has his assignment of land and a complement of one-horse equipment to go with it.

This system has persisted and continues to persist because of the absolute necessity of having enough hand labor available to handle

* A paper presented at the annual meeting of the American Farm Economic Association at Green Lake, Wisconsin, September 15, 1948.

the peak labor loads at chopping and picking time. If the farmer mechanizes the operations that can be mechanized and reduces his labor force, he has to depend on securing outside help to chop and pick his crop. Many farmers have not been willing to depend on the possibility of securing this outside or transient labor when it is needed.

There is some evidence that this pattern is beginning to change. In the Delta areas, for example, many plantations are embarking on long-range programs that will eventually lead them to complete mechanization. These programs call for a gradual reduction of the labor force and the substitution of mechanical equipment. In many instances it will mean the expansion of the use of other enterprises, such as corn, oats, and soybeans, that can be fully mechanized. A few plantations have already developed their programs to a point where they have around 100 acres of cropland per farm family. This compares with the usual pattern of 25 to 30 acres per family. There are still some obstacles in the way of complete mechanization of the cotton crop, but it is not inconceivable that over a period of the next 10 to 15 years cotton mechanization will be an accomplished fact in the Delta and western cotton areas. As this development takes place, the size of the operating unit will gradually increase. The ownership units in these areas are already relatively large, and very likely there will not be significant changes in the ownership pattern. The ownership units will be operated by a smaller number of farm families. Again, it is not inconceivable that the same ownership units can be operated by one-fourth of the families that are now engaged in operating these farms. One brief example of the possibilities offered by this development might be cited. Normally with hand-labor methods it takes about 150 hours of man labor to produce an acre of cotton. Last year the Delta Branch Experiment Station at Stoneville, Mississippi, produced a block of cotton with 39 hours of man labor per acre. Of this amount 32 hours were hand labor in chopping and hoeing. With the mechanical cotton picker that is now available, the one major obstacle to complete mechanization that still remains is weed control. If this problem can be solved, it will be possible to produce and harvest cotton with not more than 25 hours of man labor. The influence that such a development will have on the size of operating units is obvious.

The solution to the farm-size problem in the hilly and rolling plains areas of the South and Southeast is not so obvious. In many

of these areas the ownership as well as the operating units are small. In a study of one area in South Mississippi in 1942, it was found that there were three tractors on the 327 operating units for which information was obtained. The average farm family had 27 acres of cropland at its disposal. The traditional pattern of cotton, corn, and a few acres of garden and miscellaneous crops was being followed by almost all operators. This cropping pattern is followed by farmers in all the areas of Mississippi outside the Delta. The size of the unit, together with the cropping system followed, does not allow for the most efficient use of land, labor, or capital. The best land is always planted to cotton, and cotton follows cotton year after year. The unit is not large enough, nor is the land uniform enough to enable the operator to follow a rotation. Neither can he introduce other enterprises that will enable him to make better use of his land. The production of feed and pasture crops for livestock requires more land than he has at his disposal.

The fact that cotton requires large amounts of labor at certain times and only small amounts at other times gives the operator a very uneven labor load. He is worked to more than capacity during certain short periods and is either underemployed or unemployed during the remainder of the year. Because of the small size of his unit, he is limited in the opportunities he has to increase the efficiency with which he uses his labor.

A similar situation exists in the use of capital. In most instances the size of his unit is such that he cannot afford to own even the smallest types of tractor equipment. Consequently, he continues to operate with a mule and half-row equipment. The \$7500 cotton picker that can pick 150 acres in a season offers little hope for him, except the possibility that he might join with his neighbors and own one cooperatively, or he might hire one on a custom basis.

Perhaps this picture is too pessimistic, but it is a real one in many areas throughout the South and Southeastern part of the Cotton Belt. This is not to say that farmers will not or should not continue to grow cotton. The fact is that in good times and bad these farmers have continued to grow cotton. The chances are they will continue to grow cotton. It is not a matter of competing with the Delta or western cotton producers. Rather, it is a matter of alternative opportunities. With the system being used by these small operators, their major investment is their own labor; and as long as they get anything for their labor, they can continue to grow

cotton. They simply tighten their belts, reduce their standard of living still further, and grow cotton. For most of them cotton returns a greater income for the time put in than any other enterprises they can turn to.

The basic difficulty is not that they grow cotton but that the size of the unit and the alternative opportunities are such that they cannot make the most efficient use of the available resources.

This leads to the question of what adjustments should be made in the size of the operating units to make it possible to use the available resources. In order to try to answer this question, an attempt was made by the workers who participated in the Regional Cotton Adjustment Study to arrive at what might be considered a minimum size efficient unit for several different production situations. Since this regional study was completed, the members of the staff of the Agricultural Economics Department at Mississippi State College have attempted to refine these minimum efficient units for three type-of-farming areas. All information that could be obtained about crop and livestock, cultural feeding, breeding, and other practices was used in this study. In addition, information was obtained on the sizes and rates of performance of the various farm implements, and yield expectations were collected for all promising crop and livestock enterprises.

With this information and the amount of labor available to the average farm family as a base, projections were made to see what combination of enterprises with what combination of land and capital would give the greatest efficiency in the use of labor and other resources. The income that could be expected with 1943 price relationships was used as the basis for judging the relative merits of the various possible combinations.

In the three areas that have been studied, one of the most promising combinations is a dairy-cotton type of farm. With this type the farmer would continue to grow all the cotton that his own labor force could handle. In addition to his cotton, he would keep a 12 to 15 corn-dairy herd. The feed and pasture for the dairy herd would require a relatively large addition to the land resource. In fact, in order to make this possible, the amount of open land would have to be increased to about three times the size of the average farm unit in Mississippi. This would mean an increase in the size of the operating unit from 25 to 30 acres of cropland to 60 to 70 acres of cropland and an equal amount of pasture. It should be emphasized that even

then the farm would be operated at minimum efficiency. But it would mean that the farm family would have a unit large enough to furnish the labor force relatively full employment and would make possible the use of small-size tractor equipment. This size unit, with perhaps a small amount of hired help during peak periods, can be operated by the average farm family.

The operator of such a farm would not get rich, but he would receive a net farm income which is about twice as large as the average received by Mississippi farmers at the present time. The gross income for this unit with 1943 prices would be around \$3000, with a net farm income of around \$1200.

In order to refine these results still further, the Mississippi Experiment Station is operating several pilot farms that have been established along the lines of some of the minimum efficient units that have been developed. For example, at West Point, Mississippi, the Station has a 160-acre dairy-cotton unit very similar to the one just discussed. This farm is operated by a farm family that makes all the day-to-day operating decisions. The enterprise combination is planned in advance and at present is made up of 12 acres of cotton and a 20 corn-dairy herd. By using milking machines and a four-corn, walk-through milking parlor, the operator and his family have been able to operate the unit with very little extra help. The farm is operated entirely with tractor power, but the cotton is chopped and picked by hand.

Many other combinations have been worked out for other production situations. In some areas livestock combined with cotton is a promising combination. However, this type requires an even greater adjustment in size than the dairy-cotton combination. The Experiment Station has one beef-cotton type farm near Natchez, Mississippi, that has 360 acres of crop and pasture land. This gives some idea of the tremendous change that will need to take place in the size of the operating units if the production of beef cattle is to become important in many areas of the South.

In these attempts to study the influence of size on the efficiency of the operating unit, every promising combination has been projected in the form of a budget analysis, and in almost all cases the attainment of minimum efficiency with adapted enterprises and machinery will require a substantial increase in the size of the operating units. In addition, it will require improved managerial ability

and capital sources especially adapted to the needs of a long-range adjustment program.

There is not time to discuss the possible ways of achieving these adjustments or the obstacles that are in the way of their accomplishment. It should be pointed out, however, that the solution does not lie with agriculture alone. The provision of opportunities for remunerative employment in industries, services, and trades for some of the people now on farms will be one of the first essential steps in a program to increase the size of Southern farm units. There is considerable evidence that this migration has already been taking place at a fairly rapid rate. In fact, the mechanization that is taking place in many parts of the South is coming as a result of a labor shortage. As these farm families are attracted to off-farm employment opportunities, there will be more land available for the families that remain on the farm. This is the same process that has already taken place in all the other major agricultural areas of the nation. The South is late getting started, and she has yet a long way to go, but there is evidence that she is on her way.

NORTH DAKOTA FARM SIZE TRENDS— AN EVALUATION*

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NORTH DAKOTA farms are considerably larger than they were fifteen years ago. The general public, and the farm population in particular, is aware of this trend. The general reaction to it is probably mixed but many express a deep concern inasmuch as there appears to them to be a continued drift toward rural depopulation and the elimination of the small-scale proprietorship of agricultural holdings. Public opinion on the issue is based upon a mixture of fact, emotion and a lack of adequate information. In reality however, the evidence suggests strongly that there has been, during the past few years, a continual improvement in the position of the family farm in North Dakota through these expanded operations. Only a relatively small increase has occurred in the numbers of larger-than-family units. Agriculture, like other industries, has been adjusting itself to the technical revolution.¹

The main concern about the trend toward larger and fewer farms stems from an American ideal—the family farm. In North Dakota this concern has gone so far as to result in a proposal that a progressive land tax be enacted by the State, to limit landholding. We have in North Dakota a law which discourages certain types of “corporation” farming through rigid time limits to corporate tenure. The objective of these and similar measures is to promote a rather definite pattern of agriculture—one dominated by farms relying mainly on family labor, the managerial decisions resting with the family head, and large enough to provide an adequate level of living through time.

The analysis of farm size trends which follows relates directly to North Dakota. This delimitation was considered necessary in order that a report could be made at this time on some special work being

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¹ Ninety-two percent of the seeding of small grains in North Dakota was done by tractor in 1946 compared with 53 percent in 1939. The acreage of small grains harvested by tractor machines increased from 65 percent in 1939 to 97 percent in 1946. (*Use of Tractor Power, Manual Power and Hand Methods in Crop Production*, BAE, USDA, July, 1948).

done there on this question. The findings however, apply to a greater or lesser degree to the Great Plains Region as a whole.

Of the several measures of farm size—acres per farm, labor input, capital valuation, etc., the first two—acres per farm and labor input were used. The choice of such measures, we all know, is often determined by the data available to the investigator. The present case is no exception. But we feel that, particularly in the case of Great Plains agriculture, the combination of these two factors may be quite useful.

TABLE 1. FARM ACREAGE TRENDS, NORTH DAKOTA, 1934-44*

Acres per farm	Quarters (approx)	Proportion of farms 100 acres or larger†		
		1935	1940	1945
100-259	1	24 1	21 2	15.5
260-379	2	25 7	23 7	20.0
380-499	3	18 5	18 4	19 4
500-699	4	14 7	15.6	18.1
700-999	5-6	10.4	12 0	15.0
1,000 and over	7 or more	6.6	9 1	12.0
Total		100 0	100 0	100.0
No. of farms 100 A. or over		79,398	70,802	66,501

* U. S. Census of Agriculture.

† Farms of less than 100 acres were excluded since the quarter section is about the minimum unit which could be considered a *bona fide* farm in North Dakota. The 100 A. minimum is therefore a liberal interpretation.

That there have been significant changes in farm size in North Dakota is readily seen from Table 1. In 1935, one-half of the farms were either one or two-quarter section units. In the following decade this proportion decreased to 35.5 percent. The loss to these two groups was absorbed by units of four quarters or more. Only the three-quarter section farms retained their relative position, being one-fifth of the total.

The quarter section and the two quarter section farm does not adequately utilize the family labor resources in this area except where intensive enterprises such as beets, potatoes and livestock feeding constitute major sources of income. So far as both grain and range livestock farms are concerned modern equipment favors considerably larger operations. As a result of this pressure for adjustment farms of four quarters or more increased from 32 percent of the total in 1935 to 45 percent in 1945.

We are currently in the midst of research designed to discover the real meanings of these trends in North Dakota—of this process of expansion and adjustment that modern farm equipment demands. Members of county PMA offices (and the County Agent where possible) were brought together in each county to discuss the position of the family farm. One objective of these interviews was to obtain estimates of the upper acreage limits to *effective* operation of the family farm for the main types of farming in each county.² Estimates for the range livestock type varied so widely as to possess no practical meaning, but estimates for the other three main types were fairly uniform. The number of quarters of land which could be effectively handled by the prescribed labor force were estimated to be as follows:

<i>Type</i>	<i>No. of Quarters</i>
Grain-livestock feeding	4
Grain	6
Grain-range livestock	10

Accepting these estimates as reasonably accurate we may conclude that farms varying in size between one and two sections could fall within the limits of effective family operations. The changes shown in Table 1 therefore may be looked upon as adjustments compatible with our over-all goal with one exception. Farms of 1,000 acres or more may in many cases exceed the family farm objective.

This group has increased from 6.6 percent of the total in 1935 to 12 percent in 1945. Many are of the range livestock type requiring large land areas for effective family operations and may therefore be family farms. The fact should not be overlooked, however, that for this Census group the proportion almost doubled during the period under review (Table 1). The Census provides little information regarding the farming operations of this group, and yet it is precisely here that the farm size controversy becomes acute in North Dakota.

The 1947 data referred to above are helpful here. Each farm of 1,000 acres or more was listed with its cropped acreage. Almost one-half of the farms in this group fall within the range of 1,000 to 1,280 acres. In this sub-group cultivation usually exceeds fifty percent

² The suggested standard for a family labor force included the operator, a mature son and limited amounts of seasonal labor. Such a maximum permits the use of father-son agreements in the transfer of the farm from one generation to the next.

of the land area, but the total labor involved can be met by our family definition in most cases. A little more than one-third were 1,500 acres or larger, and here the cultivation is generally less than fifty percent. Here it is more difficult to estimate the required labor force. Nevertheless, recognizing the limitations of these measures of farm size, it appears reasonable to estimate that about one-half of those farms having 1,000 acres or more probably meet the family farm criteria. In other words, about 6 or 7 percent of all North Dakota farms are larger than family farm units.

Looking Ahead

Not only is the number of larger-than-family farms comparatively small but the trends shown in Table 1 virtually stopped at 1945 levels for farms of all sizes. The county records for 1947 operations indicate *the same farm size distribution as does the 1945 Census*. For a variety of reasons expansion has not been maintained during the last three years. Time permits, on this point, but a few comments derived from interviews with 375 large-scale operators.

When asked what factors had made it *desirable* for them to expand operations, the most frequent reply was that, under favorable price and weather conditions, they had been able to buy additional land to utilize family labor and machinery more fully. Land was added to increase the efficiency of available labor and machinery. What made this *possible*? The two most frequent replies were: "good crops and prices," and "reasonable land terms."


The large majority of these operators *do not contemplate further expansion*. They find their greatest difficulties now in obtaining the required machinery and dependable labor. They no longer enjoy the favorable cost-price ratios of the early forties, family labor is being fully utilized and agriculture, as all other industries, faces the same problems on the national labor market.

We are in no position to predict the duration of the farm-size stability of the 1945-47 period. It does appear however that the modal farm unit (the family farm)—has significantly strengthened its position—that recent trends toward larger farms within the family farm range are, in the main, in the best interests of a prosperous agriculture. Advocates of a strong rural social base must in the long-run include the prerequisite that the production unit be large enough to sustain satisfactory living standards.

SHOULD ALL FARMS BE LARGE?*

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FARMING has long been considered a family-sized operation, whereas urban businesses have been thought of as large scale operations. It may surprise some that we now have 38 million urban businesses, or one business for about every 38 persons in this country. By the way of comparison, we have one farm, as classified in the Census, for about every 25 persons. Nearly one-half the urban businesses are family affairs, having no paid employees, and probably another 30 percent employ not over three or four paid workers. In agriculture at least three-fourths of the farms can be classified as family farms, and so there is less difference in the usual supply of most farms and urban businesses than commonly supposed. 

Much can be read about the increase in the average acreage of farms and the predicted disappearance of the family farm. What are the facts in the case? Again referring to Census data, we find that the average size of farms in the three Lake States, Michigan, Wisconsin, and Minnesota, increased 10 acres from 1940 to 1945, now being nearly 140 acres. Incidentally the number of hired workers at the beginning of 1945 was less than half the number reported ten years earlier, while the number of family workers decreased less than 10 percent. Apparently the family farm is not disappearing in these states.

But to get back to the change in size of farms, let's see what sizes are increasing and decreasing in number. From 1940 to 1945 the total number of farms in the Lake States decreased 5 percent. Farms under 10 acres in size decreased 6 percent in number, those from 10 to 49 acres, 14 percent and those from 50 to 99 acres, 15 percent, while the number of farms in the 100 to 179 acre size decreased 4 percent in the three states. Decreases were shown in all of these sizes in all three states, except in those under 10 acres in Minnesota, where there was a small increase. On the other hand, the number of farms 180 to 259 acres in size increased 10 percent, while those of 260 to 379 acres increased 16 percent, those of 380 to 499 acres 15 percent, and the number 500 acres and over, increased from

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6,242 to 7,661 or 23 percent. Evidently there are at least as many family farms now as before, but they are larger.

What is causing this decrease in the number of farms of less than 180 acres in the Lake States, and an increase in the percentage above that size? Probably there is no one force stronger than mechanization of farm work that is causing the shift in size of farms. The number of farms having tractors in these states increased over 40 percent from 1940 to 1945, and the numbers of tractors increased over 50 percent. The value of farm machinery increased 65 percent in that five year period. Most new machines, until recently at least, required a larger acreage than many farmers were operating for efficient use; thus they rented or bought more land. In a study of land purchasers in six counties in Michigan in recent years it has been found that two-thirds of the farmer buyers were owners increasing the size of their farms, while only one-third were tenants becoming owners. Recent developments of smaller and less expensive farm machines may lessen the force of mechanization toward larger farms.

There probably are many other factors causing changes in the size of farms, but suppose we see how reasonably large farms compare with relatively small farms. The large farms in the Farm Business Analysis Project during 1945-47 in four type of farming areas in southern Michigan in which over 400 farmers cooperated, averaged nearly 300 acres in size. The smallest farms, approximately one-third of the group, averaged about 120 acres. The large farms had proportionally less livestock and had just double the man work units of the small farms, even though they were $2\frac{1}{2}$ times the acreage. They were about 15 percent less intensively operated. Building investment per acre on the large farms was 20 percent less than on the small. The machinery investment per acre was 25 percent less. Labor efficiency on the larger farms was about a fifth higher than on the small farms. In spite of these efficiencies, however, the total expenses, exclusive of the operator's labor, for each \$100 of income averaged the same on the small farms as on the large (\$61). But when the operator's labor charge is included, the farmers on the larger farms were 15 percent more efficient. Net returns per farm to the farmer for his labor and management averaged \$2,395 on the small farms and \$5,290 on the large in the four areas during 1945-47. Many farmers with small acreages, however, do a much larger volume of business than usual, and through good

management make a labor income much beyond what would be expected from the acreage operated.

In view of the apparent trend toward larger farms, and developments along mechanical and technological lines, is there a place for the small farm, or are all the advantages in favor of the large farm? Like the Michigan comparison just cited many other farm management studies show that large farm businesses, when well managed, are more efficient and yield a higher return to the farmer, especially when farm prices are rising, or are relatively high, but that the net returns on such farms frequently drop more sharply than on small farms when prices decline. In other words, earnings on large farms fluctuate more widely than on small. Certain it is that a large farm business under normal prices provides greater opportunities for those with managing ability and who are relatively young with a strong desire to make financial progress.

It is equally obvious that large farms with the greater capital needs are more difficult for a young farmer to finance when he is starting, unless he becomes a partner with his father. Likewise, it is clear that a small farm better suits some who are near retirement age and want to take life easier, or who may not need high farm earnings, or who would rather take a lower but more stable earning with more time for living. Any college professor who has said he could make more money in commercial work, but remains a professor because he likes it better, can't very well criticize a farmer for operating a small farm because he likes it better. We should think of farmers as diverse individuals placing different values upon the various compensations in farming and not just as money making machines. Thus there are needs for both large and small farms.

The question can well be raised, are we as farm management men doing as well promoting sound management and full use of practices which would increase production efficiency on small farms as we are encouraging farmers to operate larger farms? We should lay more stress on some of the newer developments in farming which the small farmer can take advantage of at low cost or which would reduce his costs. Instead of purchasing the large machine perhaps he can hire the job done, or buy the smaller less expensive machine now being developed, which is better suited to his acreage. Perhaps the small dairy farmer can cut costs with artificial insemination, and raising only his best heifers. Maybe some labor saving techniques or thriftiness in other ways would make the work easier and increase net

returns Many farmers on the smaller acreages could do a better job of the selection of plant varieties, disease control, and the like.

From the standpoint of improving operating efficiency, net farm returns, and the standard of living of farmers, farm management men have been on sound ground in encouraging larger farms for those with the ability and desire to operate such farms, but let us recognize that some people may not have the needed ability or may prefer a small farm and do all we can to help them make financial and non-monetary returns as satisfying as possible.

SIZE OF FARM IN THE NORTHEAST*

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THIS paper discusses trends and developments in size of farm in the 12 Northeastern States (New England, New York, Pennsylvania, New Jersey, Delaware, Maryland, West Virginia). The region contains a wide variety of types of farming of which dairying is the most important.

The acreage of land in farms in the 12 states decreased 26 percent from 1880 to 1945. The average acreage per farm declined from 104 to 97. However, in three states (Maine, Vermont, and New York) the acreage per farm increased somewhat.

This change in the acreage per farm is the composite result of a number of different trends. The number of farms of less than 10 acres increased 90 percent, while the numbers of all other sizes decreased (Table 1). The increased number of small-acreage farms is largely a matter of rural residences and part-time farms, although some poultry, vegetable, and greenhouse farms are included. In

TABLE 1. SIZE OF FARM IN THE NORTHEAST*

Size of Farm in Acres	Number of Farms		Percent Change from 1880 to 1945
	1880	1945	
Less than 10	48,308	91,672	+90
10- 49	201,298	167,462	-17
50- 99	227,436	147,818	-35
100-499	321,942	231,120	-28
500-999	7,205	6,673	- 7
1,000 or more	1,895	1,214	-36
Total	808,079	645,959	-20

* Basic data from the U. S. Census. The states included are New England, New York, Pennsylvania, New Jersey, Delaware, Maryland, West Virginia.

recent years, the census enumeration of these small-acreage farms has been incomplete, so that the increase in numbers is understated in the figures given here.

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The most important decrease in number of farms has taken place in the 50-99 acre group. Many of these farms have been combined into larger units.

Acreage has been used as a measure of size in this discussion because it is the only measure for which complete information is available. In the Northeast, it is a poor measure of size. There has been a tendency in all of the better areas to intensify the agriculture and do more business per acre. For example, in one area in North-western New York, the average acreage of the full-time farms increased 28 per cent from 1908 to 1938, while the total amount of business in terms of work units per farm increased 45 percent

The bulk of the agricultural production of the Northeast is becoming concentrated in the hands of a smaller proportion of the total number of farmers. A summary of data from the Sample Census of Agriculture indicates that 9,836 farms in New York had 30 or more cows in 1944. These farms were only 9.4 percent of the total number of farms producing milk, but produced one-third of all the milk in the state. In 1946, there were 319 farms in New York which had 100 or more acres in potatoes. These farms had 30 percent of the state's potato acreage and 2 percent of the United States acreage.

This concentration of the agriculture in the hands of fewer farmers does not mean that large-scale farm organization has taken over in the Northeast. Very few dairy farms are larger than a 3-man business. With efficient organization, three men can handle a 60-cow dairy and grow the accompanying crops.

In the fruit and vegetable areas there has been some increase in large-scale operations. Even in these areas, the most common farm organization is one where a labor force of one to three men handles the work during most of the year. A much larger labor force is needed in harvest. Thus, these farms have a family type of labor situation during most of the year, but a large-scale labor organization at harvest. The concentration of fruits and vegetables in a few well adapted areas has brought the migrant labor problem to the Northeast.

To sum up, the trends in size of farm in the Northeast are as follows:

1. A rapid expansion in the number of rural residences, where farm operations are conducted primarily for home use and amusement.

2. A tendency towards an increased acreage per farm on the full-time farms.
3. More intensive use of the best land, making more business per acre.
4. An increased use of migrant seasonal labor in the specialized fruit and vegetable areas.
5. A concentration of farm production in the hands of a smaller proportion of the total number of farmers, but no general trend away from the family type of farm organization. This concentration of production with its resulting increase in efficiency leads to a better standard of rural living and cheaper food for the cities.

SIZE OF FARMS*

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THE size of farm in Missouri and surrounding states is more meaningful if analyzed by type of farming regions. The three which predominate in this area are the Corn Belt Transition Region, The Corn Belt, and the General Farming Region. Census reports have served as the major source of data with sample counties selected in each region.

The average size of farm in the western area of the Corn Belt Transition Region is over 400 acres. In the southern area of this same region, which covers most of Missouri north of the Missouri River, it is 180 acres. In the Corn Belt the average size is the quarter section. In the General Farming Region in the southern part of Missouri and adjoining states it is 130 acres. Within this latter area the average size of farm tends to decrease from 185 acres in eastern Kansas to 100 acres in north-western Kentucky.

The difference in size of farm based upon average investment is almost as great as the difference in number of acres. The average total farm investment in the Corn Belt is \$25,000. In the western part of the Corn Belt Transition Region it is \$15,000, in the southern area \$10,700 and in the General Farming Region it is only \$6,220. In this latter region the most common size of farm is 80 acres with an average investment of \$3,300.

In expressing size of farm in terms of gross income, the modal income size has been used. The modal income in the Corn Belt was from \$6,000 to \$9,999. In the western part of the Corn Belt Transition Region it was \$2,500 to \$3,999. In both the southern part of this region and in the General Farming Region the most common income was from \$1,500 to \$2,400. In some local areas in this latter region, however, it was as low as \$600 to \$999.

In analyzing the changes in size of farm, only two measures have been used, namely acreage and gross income. The number of farms from 20 to 49 acres in size increased during the depression years but have been decreasing since then. From the standpoint of agricul-

* A paper presented at the annual meeting of the American Farm Economics Association, Green Lake, Wisconsin, September 15, 1948.

tural production, this group has little significance and many are farms by census definition only.

The general trend in the proportion of farms in the 50 to 99 and 100 to 174 acre groups has been downward. The decrease since 1930 has been as large as 40 percent in the western area of the Corn Belt Transition Region. Within the General Farming Region where the proportion of small farms is greater, the decrease has been the least.

The proportion of farms in the 175 to 259 acre group has remained about the same. The number in the 260 to 499 acre group has increased by about 25 percent since 1920. The number of farms in the 500 to 999 acre group has increased over 75 percent and those over 1,000 acres, except in the General Farming Region, have more than doubled. The proportion of farms falling in these latter two size groups is still relatively small.

In analyzing changes in size of farm in terms of gross income three classes were used. (See following table.) In the General Farming

DISTRIBUTION OF FARMS BY SIZE MEASURED IN TERMS OF GROSS INCOME
1930 to 1945*

Gross Income Class		Corn Belt Transition Regions	Corn Belt Region	General Farming Region
		(percent)	(percent)	(percent)
Inadequate Farms (\$400-\$1500)	1930	54	35	78
	1940	62	39	78
	1945	47	29	76
Family Farms (\$1500-\$10,000)	1930	44	62	21
	1940	37	59	21
	1945	51	68	23
Larger Than Family Farms (over \$10,000)	1930	2	3	1
	1940	1	2	1
	1945	2	3	1

* All values adjusted to 1939 price level.

Region a relatively high proportion of farms were inadequate. From 1930 to 1945 there was little movement from the inadequate to the family farm. In the Corn Belt Transition Region there was a reduction of about 7 percent in the number of inadequate units with a corresponding increase in the number of family farms from 1930 to 1945. The gain in Family Farms in the corn Belt was 6 percent and the proportion of farms in this class was relatively high.

Both acreage and income data indicate little or no significant

trend in the direction of farms that may be considered large or larger than family size. In analyzing the trends it is evident that some progress has been made in the reduction of the number of small or inadequate farms and a corresponding increase in the number of family size farms. More progress, however, has been made in the better farming areas where the problem of inadequate units is less acute than in the Ozark hill area and other parts of the General Farming Region.

ROUNDTABLE ON RISK AND FINANCE

Chairman: F. F. Hill, Cornell University

RISKS IN AGRICULTURAL LENDING¹

R. C. ENGBERG²

Farm Credit Administration

IN ANY discussion of risk in agricultural credit, it is necessary first to distinguish between risk to lenders and risk to borrowers. The thoughts in this paper will be confined largely to lenders' risks. The scope will be narrowed still further to a consideration of the means of protecting lenders against risk. For purposes of this paper these methods have been divided into four groups as follows: 1. Knowledge and judgment of the lender; 2. Loan policy; 3. General programs to improve and stabilize farm income; and 4. Pooling of risks. There is no pretense, of course, that full consideration can be given to these topics in a paper of this length. At best, it will be practicable only to outline some of the more pertinent problems.

Informed Judgment

Probably the most fundamental safeguard is for the lender to have full information about the man, his farm, and his operation, and then to know how to evaluate that information. As to the man, this includes his past performance in business contracts, his financial position, and his moral character. This point may seem very elementary but there are, nevertheless, some related problems on which further research would be helpful. In long-term lending, for example, how can the lender in his loan commitment safely recognize the greater debt repayment capacity of the above-average operator? The general theory is to base the loan on the probable capacity of the average operator since the high-grade man may become incapacitated or die or sell and be succeeded by a poorer operator. Some questions are (1) What are the odds the good man will be on the job until the loan is reduced to a safe average level? (2) How dependable is the assumption that good men gravitate to good land

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² The author is solely responsible for this paper and no parts thereof should be construed as necessarily representing official views or policies of the Farm Credit Administration.

and *vice versa*? (3) Is it practicable to protect against the death hazard by requiring assignment of life insurance until the loan is reduced by some specified amount? (4) To what extent can the risk be further reduced by effective father-son arrangements in order to assure a satisfactory succession in the event of death?

The last question suggests another. Several studies show that farmers generally make their highest earnings before the age of 40 and that thereafter farm income declines with increasing age.³ How much of a risk factor is this with loans for either short and long terms? Is it practicable to take account of this factor in day-to-day loan operations?

Included in this first category of risk protection procedures is the necessity of knowing the farm, its physical productive capacity, and the probable dollar expense and income. This requirement opens up a vast field of exploration into methods of improving the estimates of the income and value of individual farms, and budgeting the loan program to these estimates. This includes the problem of forecasting prices and costs both for the short-run and for the longer-term loans. The latter aspect of the problem may be illustrated by just one question: If you were risking your own money in making 25-year farm mortgage loans, what prices of hogs, beef, dairy products, wheat, etc., would you use now in estimating long-run repayment capacity of your borrowers?

An accurate appraisal must be made of the physical capacity of the farm itself. Progress is being made in evaluating the productivity of various soils. Methods of classification are being used to reduce the error in estimating productivity. The constant improvement of varieties and tillage practices, mechanization, erosion on the one hand and conservation on the other, increasing use of fertilizers, and all other technological developments are complicating factors. This is an important field for research and about which the lender needs to keep a steady flow of information in order to measure loan risks adequately.

The large institutional lenders are in a position to have men specialize in certain areas or in certain lending functions and thus build up the necessary "know-how" on such problems. Some carry

³ See, for example, "Age of Farm Operators," *Farm Economics*, Cornell University, October 1946; *Relation of Variations in the Human Factor to Financial Returns in Farming*, Minnesota Agricultural Experiment Station Bulletin 288, June 1932; and *The Human Factor in the Management of Indiana Farms*, Indiana Agricultural Experiment Station Bulletin 369, August 1932.

on research to improve the procedures and knowledge. Small lenders unable to specialize or conduct research, however have an opportunity in some areas to employ such specialized knowledge for a fee. In many agricultural communities appraisal services are available and, when competent, the risk on farm mortgage loans may be reduced when based upon such appraisal. It has been proposed that the availability of such service be broadened by establishing a public appraisal system.⁴ While some advocates of this proposal have emphasized its value in connection with farm purchases, it would also represent one way by which small lenders could reduce risk through purchase of "informed judgment" in making loans.

Information and judgment usually cost money. The lender must decide how much information is needed, in what ways it may be obtained, and the costs of each method in relation to the value of the information in reducing risk. The answers to such questions will depend partly on the size of the lending business and partly on business policy.

Loan Policy

A second general method of risk protection is by adjustment of loan policy. One of the more obvious ways by which loan policy can be controlled to influence risk is in the amount loaned. The relative amount or size of the loan can be measured by comparing it with the value of the collateral or with the farmer's net income. The relation of risk to size of loan can be studied best when there are available data covering a large number of loans over a long period of years and on similar farms. The following data covering the loss experience with 450 Federal land bank loans closed from 1917 to 1932, inclusive, in a uniform area in southern Idaho illustrate the possibilities in the field of farm mortgage credit:

<i>Loan per cultivated acre</i>	<i>Number of loans</i>	<i>Loss per \$100 loaned</i>
Less than \$50	66	\$0.15
50-69	148	.85
70-89	179	2.64
90 or more	57	5.95

⁴ Three of the major farm organizations, namely, the American Farm Bureau Federation, the National Grange, and the National Council of Farmer Cooperatives have endorsed the establishment of a public appraisal service in connection with other agricultural credit legislation. The report on Postwar Agricultural Policy, issued by the Committee on Postwar Agricultural Policy of the Association of Land Grant Colleges and Universities, in October 1944, and the proposals made here at Green Lake a year ago by the committee reporting on The Federally Sponsored Credit Services to American Agriculture included similar recommendations. *Proceedings*, November 1947, pp. 1485-87.

It is not difficult to visualize how such results will help to adjust loan policy to the particular amount of risk which the lender wishes and is able to assume, provided, of course, that proper allowance is made for any changes in farmers' ability to earn net income and repay loan obligation which may have taken place after the period covered by the loan experience. If the experience occurred when the type of farming were built around cotton, for example, and the prevailing type is now dairying, the previous experience might not apply. Permanent changes in price levels or costs likewise would affect the interpretation of past experience. In addition to such voluntary adjustments, the loan policy of lenders subject to State or Federal supervision generally is limited in various ways by law and regulation, usually for the purpose of reducing the risk.

Risk may be further controlled by a policy in selection of loan areas. Some lenders, particularly insurance companies, attempt to limit risk by concentrating their loan activities in areas which are recognized as relatively safe. Farm mortgage lenders generally avoid areas subject to frequent overflow or similar hazards. Some refuse to make loans in irrigation districts where stable and adequate earning capacity has not yet been demonstrated.

The farm ownership loans of the Farmers Home Administration illustrate two other aspects of loan policy designed to reduce risk. These are supervision and careful selection of borrowers. These policies are intended to offset the greater risk that would normally be associated with still a third policy, namely, lending a relatively large percentage of the purchase price of the farm. Other aspects of loan policy which can influence risk are the interest rate, rate of repayment, and method of repayment.

This second group of methods of protecting against risk, like the first, contains many fields of fruitful investigation. The matter of relative risk of various ratios of amounts of loan to some standardized appraisal is only one of the more obvious subjects of study. Another that would have considerable value to both public and private lenders is the rate of risk reduction that may be anticipated for various amounts and types of supervision. Measurement of geographic variations in risk likewise should be of considerable value to lenders in a position to select their loan areas.

Stabilization of Income

A third group of devices which reduce risk consists of various programs, both public and private, which have the effect of main-

taining and stabilizing farm income. These include the price support program of the Federal Government, crop insurance, educational and research activities, all efforts both Governmental and otherwise to establish conservation practices on farms, and any other programs which eventually may have beneficial effects upon farm income.

In addition to those which have just been mentioned, there is another set of devices which should be mentioned and which appear to fit better under this category than any of the other three. These include the requirements by the lender that the borrower maintain adequate fire and hail insurance. It would likewise include title insurance if and when carried by the lender. As has been mentioned, life insurance also is used sometimes in connection with loans as a protection to both the lender and the borrower.

The stabilizing effect upon farm income of these and other similar programs is particularly significant since one of the most important causes of risk in farm credit is fluctuations of the income from which loan repayments may be made. The risk in making a loan can be reduced if the lender needs to be concerned only about estimating the level of the income and does not have to take into account the possibility that the income may vary widely from year to year. The relationship between variability of income and risk, therefore, offers a promising field of study.

Pooling

The fourth category of risk protection arrangements, outlined at the beginning of this paper, is pooling. This is simply the advantage of being able to have a large enough volume of loans distributed over sufficiently diverse conditions to minimize the possibility that any single disaster will affect any large share of the total portfolio. When risks are spread over a large volume of diverse farming operations, the losses from the accidents and mistakes which inevitably occur are not likely to loom very large in the total.

Small local pools may have the advantage of closer acquaintance and contact with the borrower but they lack the volume and greater diversity available in regional or national pools. In operations conducted over a single county or perhaps a few adjoining counties the loans are likely to represent only one major type of farming and one common set of weather, soil, and other conditions. Drouths,

disease, price declines, loss of markets, and similar disasters are likely to affect the entire loan area.

The limited size of the risk base is an element of weakness in the structure of the production credit associations, national farm loan associations, country banks, and similar institutional lenders. The eight PCA's which have become insolvent (all prior to 1939) served areas having one major product such as apples, potatoes, or truck crops. The number of NFLA's which sustained capital impairment during the depression undoubtedly was increased because of their inability to spread their risks over more than one or several counties. In the case of both systems, an effort is being made to build protection against such risks by improved loan policies and adequate reserves and net worth. The PCA's, in a sense, have been able to spread some of the risk through the capital stock subscribed by the production credit corporations. In 11 districts the NFLA's have entered into agreements with the Federal land banks to share losses on a 50-50 basis. This arrangement spreads half of the losses over bases equivalent to several States.

In the case of commercial banks, the small risk base is probably more serious for non-member than member banks. Inadequate re-discounting opportunities during periods of strain make non-member banks more vulnerable to forced loan liquidations. This possibility is of most importance in such States as Iowa and Wisconsin where non-member banks held over 50 percent of the non-real estate agricultural loans of the principal lenders on June 30, 1947. There were 13 States in which non-member banks held a third or more of such loans. The ability of member banks to rediscount with the Federal Reserve banks, of course, does not protect them against losses but it does increase the likelihood that if a local disaster comes, a bank can avoid forced liquidation which tends to result in losses.

Loan Insurance

The method of spreading risks of smaller lenders proposed most frequently is some form of insurance against loan losses. A year ago the committee reporting here at Green Lake on Federally sponsored credit services to American agriculture suggested such a program for the credit institutions which were proposed.⁵ Suggestions also have been made that a Nation-wide system of insurance for farm

⁵ *Proceedings*, November 1947, pp. 1472-78

mortgages be established for all institutional lenders similar to the facilities now available in the urban home mortgage field through the Federal Housing Administration. A limited form of insurance is already in operation by the Farmers Home Administration.

It will be possible to mention only a few of the many problems involved in considering a loan insurance program for agriculture. One of the first may be the premium rates that would be required. It might appear that since the institutions in the FCA have been in operation from 15 to 31 years, their body of experience should provide a very good basis for determining premiums. Unfortunately the experience of each group of institutions has been affected by special circumstances to such an extent that the data would have to be mixed with a great deal of judgment in using them as guides for this purpose.

For several systems the limiting fact is that except for relatively short periods the institutions have operated only on a rising price level. This is true of the banks for cooperatives and the production credit associations, for example. The banks for cooperatives organized in 1933 had closed up to June 30, 1948, \$3,235,000,000 in loans, including renewals. The losses actually sustained plus the valuation reserves for losses on loans in force amount to about one-eighth of one percent of the amount loaned. The production credit associations have made cash advances (excluding renewals) of \$4,515,000,000. Including valuation reserves, their losses amounted to only one-tenth of one percent.

For both systems these are very small rates of loss. The question is, however, if one were setting up premium rates for Nation-wide insurance, what adjustments should be made for the fact that during the next 15 years the price trend may be in the opposite direction from that prevailing during the past 15 years?

The Federal intermediate credit bank system has been in operation for a longer time—25 years. During this quarter century, which has included both falling and rising prices, the rate of loss on over 12 billion dollars of loans and discounts (including renewals) amounted to only one-fourteenth of one percent. This experience would not serve as a guide, however, for primary lenders such as country banks or production credit associations since the intermediate credit banks are principally wholesalers rather than retailers of credit and sustain losses only when the resources of the endorsing institution are inadequate to meet the obligation.

In the long-term field the Federal land banks have been in operation 31 years. As of June 30, 1946, the accumulated Federal land bank losses including valuation reserves for losses, when expressed as an average annual rate on loans outstanding from 1917 to that date, amounted to .50 percent. If Land Bank Commissioner loans and related losses are included, the average annual rate is raised to .62 percent. This experience, however, covers a variety of appraisal and loan policies and other factors which would have to be interpreted before the results could be used as a guide in determining insurance premium rates. For example, appraisals for the early loans were based on current market values. From 1933 to date, appraisals reflect normal agricultural values. Prior to July 1, 1945, land bank loans were limited to 50 percent of the value of the land and 20 percent of the insured permanent improvements. Since that date they have been limited to 65 percent of the total normal agricultural value of the farm. To the extent that Commissioner loan experience would be considered, it should be recognized that such loans were on the books during a period when the trend of farm commodity prices was almost continuously upward. There were wide geographic differences also in the loss rates.

If and when any insurance program were being constructed, the experience of the FCA units certainly would throw valuable light on the problem of establishing premiums. It is also clear, however, that there would need to be considerable supplementary analysis and judgment, taking into account credit policies and other conditions that would affect the loan experience.

A second question that comes up in connection with loan insurance is the problem of maintaining an adequate incentive for the local lender so that the burden of guarding against unsound loans will not be placed wholly upon the insuring institution. This would be a particularly important aspect in any discussion of Nationwide insurance programs within the FCA. The pattern in that system has been to build strong local cooperatives and to attempt to encourage the local units, that is, the national farm loan associations and the production credit associations, to take increasing responsibility in closing and servicing loans. It has been felt that if all loans closed were insured fully against losses the local officers and directors might lose interest in this responsibility and a principal advantage of the cooperative form of organization might be lost.

Other questions in connection with loan insurance are who would

pay the premiums, the lenders or the borrowers, and who would be benefited? The incidence of the premium would be determined largely by the competitive situation. If most lenders eventually came into the insurance plan, however, the interest rate on insured loans probably would tend to dominate the market, and borrowers then would be paying most or all of the cost of carrying the insurance.

In the event the incidence of the premium rate should be on the borrowers, their credit costs would rise, but the facts suggest that there would be little or no compensating improvement in agricultural credit service. In view of the conditions existing in the urban home mortgage field in 1934 when it was organized, there seems little doubt but that the insured loan program of the Federal Housing Administration increased the availability of credit and improved the credit service in other respects. In agriculture, however, credit services already have been developed and improved through other means to a point where, from the borrowers' standpoint, they are equal to what is available in the urban field. There is not now the same opportunity, therefore, for improvement in agricultural credit service as existed in the urban field when the Federal Housing insurance program was established. In at least one respect, moreover, the farm mortgage credit service is better than in the urban field. In the insured urban system, there is no plan for forbearance or leniency in the event the borrower is in temporary distress. On the contrary, the rules favor prompt foreclosure by the lender. The Federal land bank system has a well-developed and tested forbearance policy. Since the system is owned by the borrowers, it provides a better chance of fair treatment in times of emergency. Equal consideration should be available to borrowers from the Farmers Home Administration.

In the short-term field, there is, of course, no insured loan program for urban borrowers with which comparison can be made. Improvements have been made in short-term agricultural credit service, however, to a point where borrowers would have very little to gain through adding over-all loan insurance. At the same time, it must be admitted that the PCA system and probably also the banks for cooperatives would be strengthened if some way could be evolved to spread the risks on a Nation-wide basis without losing local initiative and incentive. This might not need to add to the

present interest rate but might be effected by diverting part of the local reserves to a national reserve.

While the advantage to borrowers would be very doubtful, there is probably little question that lender would receive some benefit from an insured loan program since it would provide another outlet for investment funds with an assured return. Whenever a lender chose to participate in making insured loans, however, some flexibility in operations would be sacrificed.

These brief comments on loan insurance suggest that in the event any Nation-wide, over-all plan for agricultural credit should be considered there are many problems that will require careful study. The first questions should be. In view of present credit facilities, is it really needed? Will credit service be improved? Who will pay the premiums? The present evidence indicates a negative answer to the first two questions. If the answer should be in the affirmative, however, then there will be further questions such as: Should the insured lender assume some liability for loss? What premium rates will be required? Should there be separate pools and graduated premiums for different degrees of risk? Should the insurance plan be self-sustaining? To what extent, if any, should the Federal Government assume liability for insurance claims? Since the success of farm mortgage loan insurance will depend largely on an efficient appraisal system, should it be built around the present, seasoned Federal land bank appraisers or should a new, competing system be formed?

In this paper it has obviously been possible to do no more than touch on a few of the many interesting and practical problems in protecting lenders against risk. Possibly it will serve at least to assist in outlining the subject and to stimulate interest in studies in this field as they appear in the future.

DISCUSSION*

LAWRENCE A. JONES

National Bureau of Economic Research

Dr. Engberg has comprehensively outlined the various elements of risk facing farm lenders and has indicated methods of minimizing and sharing losses. He gives special attention to the pros and cons of loan insurance programs which at times have been proposed.

* A discussion at the Annual Meeting of the American Farm Economic Association, Green Lake, Wisconsin, September 15, 1948.

As a basis for examining an insurance program I would like to look at risks as being of two types. First is the risk that exists irrespective of area. This risk is closely related to chance; the usual chances that a borrower will turn out to be a bad manager, a poor moral risk, become sick or die; or the chances that there will be errors in judgment in properly appraising the variations in individual farm businesses that occur in an area. Although these risk factors are often accentuated in bad times, they tend to be uniform throughout the country.

The second type is the area risk. Varying degrees of risk from area to area result from wide differences in geographic characteristics, soil, topography, climate, type of farming, and economic peculiarities as relates to prices, markets, and off farm employment. I have in mind the various areas of farm-mortgage distress shown on a map being developed in connection with a study of the National Bureau of Economic Research. For the interwar period one of the areas of blackest experience covered practically all of the Great Plains. Another region of heavy foreclosures and losses was the eastern Cotton Belt centering in Georgia. In the Corn Belt, farm-mortgage distress was very acute in southern Iowa and northern Missouri. Other trouble spots included parts of the Lake States and sections of the central Cotton Belt, Mississippi, Arkansas, and Oklahoma. Distress was widespread in these areas, even for many of the more efficient operators on good farms.

Areas of relatively good farm loan experience which stand out sharply include southern New England, parts of central Corn Belt, western Texas, and a strip about 100 miles wide along the Pacific.

An accurate forecast of future loan losses as a result of this experience can not necessarily be made. As Dr. Engberg indicates, a great deal of sound judgment is needed to properly appraise the influence of various factors. Because of basic geographic characteristics, however, there is little doubt that some areas are high risk and others low risk. I believe most lenders recognize the high risk in sections of the Great Plains where average annual rainfall is under 20 inches, or parts of the Corn Belt where soil quality is poor and topography is rough, or in portions of the Old South where soil fertility has been depleted, dependency is on cotton, and boll weevil is prevalent. On the other hand, basically lower risks are recognized such as in the central Corn Belt where yields are high and dependable, and in the northeast with its relatively stable economic conditions.

In view of these two types of risks—those irrespective of area and those which are characteristic of an area—what can lenders do to minimize losses or their effects? Dr. Engberg has mentioned many of them: varying the loan ratio, adopting a strict selective program for both man and farm, or providing supervision of farm operations.

For a further analysis of the risk problem it is necessary to look at the type of lender: large-scale lenders such as the Federal land banks and insurance companies, and small-scale lenders such as commercial banks and individuals.

The "chance" risks which exist in all areas are quite adequately coped with by the large-scale lenders. Such risks are sufficiently spread so that

the need for an insurance or pooling program is small. For local lenders, on the other hand, who operate in a small area with few loans, insurance or pooling may well be desirable to effect the proper spreading of such risks.

With the second type of risk, where wide differences exist between areas, a nationwide insurance or pooling program would be a possible means of protecting lenders both large and small from the effects of localized losses.

In this connection one encounters many of the questions raised by Dr. Engberg—lender incentive, government support and liability, premium rates and area differentials. Such problems could probably be worked out in the development of a program. Notwithstanding, I agree that we should not be too hasty in this direction.

I wonder if the fundamental problem facing lenders with respect to different area risks is not one of *income*, or establishing a rate of interest high enough to cover all costs. If a better adjustment could be made between costs of doing business in an area and the rate of return, much of the need for a loan insurance program—for large lenders at least—might be eliminated. Time does not permit an analysis of the factors affecting interest rates such as cost of money, administration costs, customs, and competition. I would like to seriously question, however, whether the long time risk cost is reflected as much as it should be in the interest rate.

For the various farm mortgage lenders, rates tend to be uniform throughout the country. This tendency exists for insurance companies, commercial banks, and individual lenders, as well as for federally sponsored lenders. Current average interest rates on outstanding farm mortgage debt range only from 4.3 percent in the West North Central to 5.0 percent in the South Atlantic. In view of the widely differing risks, known to exist, a narrow range in interest rates throughout the United States hardly seems justified from the standpoint of each area paying the full cost of credit used.

I realize that lack of a precise measure of risks, practical administrative problems, and even political and social considerations are strong forces for maintaining a uniform rate. If, however, it is desirable that each broad area of high risk stand on its own feet and not be subsidized by low risk areas or the lender, I believe many of these problems could be overcome as our understanding of agriculture grows and improved lending practices develop.

DISCUSSION*

ELI FERGUSON

The Equitable Life Assurance Society of the United States

As usual Dr. Engberg has done a fine job. He has very ably outlined the various factors of risk in farm mortgage lending and has pointed out some which could well bear further study.

While I am most interested in all phases of research in connection with farm loans, my day to day work is in helping to administer a farm mort-

* A discussion given at the annual meeting of the American Farm Economic Association, Green Lake, Wisconsin, September 15, 1948.

gage business—deciding whether a certain loan should be made and if so for how much. My remarks, therefore, may reflect a little different viewpoint, but not greatly so, because I know Dr. Engberg is very close to the actual operation of the Farm Credit Administration.

When I read the title of our subject for discussion some weeks ago, I wondered if Dr. Engberg might not discuss a risk factor which surely is regarded as very important to the Federal Land Banks, to their many friends interested in seeing the continuation of a sound cooperative farm credit system, and especially to the borrowers presently owning stock in National Farm Loan Associations. I refer to the risk inherent in making long-term loans with funds that have been obtained by borrowing on a short term basis—lending money for 25 to 35 years that, according to present obligations, must be repaid or refinanced within five or six years. The Banks should be especially concerned since interest rates have been rising for several months and refinancing could not be done on anything like the low rates now enjoyed.

It is hardly conceivable to me that any substantial lender would continue to expose itself to such a risk for very long. The current heavy rate of payout, of course, is some protection, as well as the surplus funds of some of the Banks; but the only sensible way, in my opinion, to meet the problem is to avoid in the future having such large maturities in short term issues and to keep the interest rate on new loans in line with the money market. I have heard rumors that an increase in rates by the Federal Land Bank System is imminent. I think I can say with certainty that it need have no fears of its competition not following suit immediately. Insurance companies cannot continue a four percent interest rate much longer with sharply increasing costs of doing business and the heavy payout, furthermore, with alternative types of investments yielding a higher net return, money just will not continue to be available for farm mortgages. Interest rates have been at an artificially low level for several years and the effect on borrowers of a half percent increase will be negligible.

On rechecking the title which Dr. Hill assigned to us, however, I find that it is "Risk and Finance" rather than "Risks of Finance." Possibly then my remarks are out of order in this discussion, but we in the Equitable Society are much interested in the continuation of a sound, cooperative credit system owned and managed by its members. We take this position because we think the alternative is direct loans from the United States Treasury. No private lending organization could compete successfully with such credit because it would very likely not be conducted on a business basis. Such lending by the Federal Government is bound to cost the taxpayers a lot of money and would be a very significant further step toward Socialism. We think that if the Federal Land Bank System continues much longer exposing itself to the risk I have described, it will be doing so with the full expectation that the Federal Treasury will come to its rescue if it is found impossible to refinance its obligations at interest rates which will keep the system solvent. The Land Banks are now owned by the farmers. Would it not be better for them to manage their financial affairs with the foresight of a great public utility, railroad, or any other organization with long term commitments?

I believe that Dr. Engberg in his opening statement makes an unnecessary distinction between the risk to lenders and the risk to borrowers. We in the Equitable Society have always looked on the risks of farm mortgage lending as applying both to the borrower and the lender. In fact, the impact is even greater on the borrower because equities are always wiped out first. We try to make our loans so as to preserve those equities and I believe Dr. Engberg's organization also does. Our guiding principle is that the Equitable Society's objective in making farm loans is to help farmers buy farms of their own and eventually have them free and clear. By keeping that objective firmly in mind many policy decisions are made less difficult.

No doubt the greatest risk arises through one of the most common errors—lending too much money, especially on low grade farms. Considerable research has proved what every loan man knows, that most foreclosures and nearly all losses occur on the low grade farms.

The safest thing to do, of course, is just not lend on such farms. Many lenders try to follow that policy and think they are successful in avoiding such loans but the fact remains that they are making many hazardous loans on medium and low grade properties. Some folks are inclined to blame the appraisers for this weakness, citing as a common fault over-appraising low grade farms. I think appraisers are perhaps partly to blame, but the appraiser, in my opinion, should not be expected to do more than determine value based on the market. He is paid for his judgment of what the property would sell for under a given set of conditions. We define those conditions as including (1) a willing, but not forced seller, (2) a desirous, but not anxious purchaser who is experienced in the area and is buying for agricultural purposes, (3) climatic and seasonal conditions typical of the area, and (4) prescribed normal commodity price and cost of production conditions. If buyers meeting those qualifications have consistently under those conditions paid a certain price for a certain property or comparable properties, then that price, in my opinion, is the value. Without question such a price includes perquisites that will not pay any interest. A farm provides a place to live, a place to work, a place to exist, if you wish, and on a low grade farm those things bulk large in proportion to the total advantages of owning the farm. But they do not pay interest. It is clear, I think, that the debt-paying capacity of a poor farm is proportionately much smaller than the capacity of a good farm, and loans of equal percentage of the value of all classes of farms result in overlending on the poorer farms.

The only answer I believe is for the farm loan executive to see that the appraiser does a good job of appraising all classes of farms on the basis of values as determined in the market place. The loan executive can then vary the amount loaned depending on the classification of the farm. We do not hesitate to approve loans of 60% to 65% of the appraised value of top quality farms, but we cut these percentages down rather fast as the classification of the property is lowered. One cannot be inflexible in the matter, but as a working rule we try to limit our commitments to about 60% of the value of A farms, 55% of the value of B farms, 50% of the value of C farms and 40% of D farms. We do not make loans on low D and E farms if we know it. The alternative to this method is to devise a set of obscure

theories of value and appraisal and procedures which will fix the value at a figure, 65% of which is a sound loan. That may have advantages where the appraiser is the guardian of the loan committee. Personally, I much prefer the method we follow.

Many of you have seen the farm loan appraisal manual which we published last spring. This 64 page booklet is our instructions to salaried appraisers of the Equitable Society. We printed and made it available to the public in the hope that it will be used as a practical guide to farm appraising and as a supplemental text book by teachers of appraisal methods and farm finance. We believe that anything we can do to develop a broader understanding of appraisal problems and methods will reduce the risk to both the borrower and lender.

Dr. Engberg very properly lists personal habits and ability of the borrower as a most important risk factor and suggests that further research might be helpful in guiding lenders to recognize the repayment capacity of the above average applicant. He points out that the general theory is to base the loan on the capacity of the average operator since the high grade man may become incapacitated, die, sell or be succeeded by a poor operator.

The Equitable Society does not follow this general theory but does make heavier loans to the above-average risks than it would to the typical borrower and protects itself in one of two ways. The simpler and less effective way is to include an agreement in the mortgage to the effect that the borrower will reduce the loan to a specified figure in the event the property is sold, and that if the loan is not so reduced, we have the option of calling the loan. While we have used this method only about three years, it has enabled us to obtain the desired reduction on almost all loans where it was used. Of course, occasionally the new owner is just as capable as the old, in which event we sometimes waive the requirement.

Our second method of meeting the requirements of the above-average risk is to take a bankers' view of the excess portion of the loan and require it to be repaid in extra heavy instalments over the first year or two. In making such a requirement we examine carefully the applicant's financial statement and ability to pay.

There are several advantages to this latter procedure, most important being that if there is an undisclosed weakness in the borrower it will show up soon, and if the market value is presently high as compared with the appraisal we can require some action before the market goes down. Also, this enables us to administer our own mistakes rather than leave them for someone else to take care of several years hence.

We have made several thousand such loans and so far, with only one or two exceptions, all of those special payments have been collected or the property improved to a point where they were no longer necessary.

Dr. Engberg has touched on the many problems involved in establishing commodity price levels and cost relationships as a basis for appraisal. We are working on those problems all the time. At present we are using in our appraisals approximately the prices and cost levels in effect shortly before

the war, but as soon as prices have adjusted themselves to the post-war situation we shall have to develop new price levels and cost relationships based on the new conditions. There is a vast amount of work to be done when that time comes, especially in developing reliable cost of production figures for the various crops, types of farming and areas.

Several of the special features of loan plans currently available serve to reduce the risk to the borrower and the lender. Long term amortized loans which are paid in full at maturity and do not have to be renewed, eliminate the risk to the borrower of having to refinance on an unfavorable money market.

Special prepayment and reserve privileges also serve to reduce the risk to both parties. For example, the Equitable Society for many years now has included a provision in all of its notes permitting borrowers to pay off any amount at any time received from farm income. For several years now, one-fourth of the principal on our books at the beginning of the year was paid off during the year. This has cost a lot of earnings, but each year we have graduated a class of boosters for the Equitable, in considerable contrast to those who had their loans with companies which refused to accept prepayments from farm income.

About one-fourth of our borrowers have taken advantage of the Society's Prepayment Reserve Plan by which extra payments are held to meet interest and principal payments in lean years. These funds are held in reserve without interest, but we stop interest on an equal amount of the loan, so, in effect, the borrower earns interest on these reserve funds at the loan rate. Thus, we try to make it easy for an Equitable borrower to protect himself against the risks of crop failure, temporarily low prices and extra expenses through illness or other misfortune. The Federal Land Banks offer a similar service in their Future Payment Fund.

Another method of reducing risk to borrowers and lenders is considerate handling of delinquencies. Delinquencies are inherent in the farm mortgage business, and compared with other types of mortgages the delinquencies are always larger. This is partly true because farm mortgage maturities are once or twice a year instead of monthly. The amount of delinquency on an annual payment loan is twelve times the amount on a monthly payment loan. And if there is a crop failure, hailstorm or other misfortune it may be another full year before a payment can be made. In the meantime, the loan executive must have complete confidence in his judgment that the account will be brought in good standing in a reasonable time. This calls for a thorough understanding of the type of farming involved. We take the position that we have no business making farm loans on types of farming which we do not know enough about to administer defaults reasonably. Stated simply, we require borrowers to pay, if they are able to pay, even though payment may have to be made from some other sources than earnings from the farm. When they are unable to pay and there is a reasonable chance of them being able to pay later, the next year or the year following, we carry on with them, but when the situation becomes hopeless we believe further delay of transfer to other hands does no one any good

Foreclosures are unpleasant matters to administer and that is one of the principal reasons why we exert every effort to reduce risks to a minimum and try to avoid making high loans

The statistics would indicate that we have been very successful in our lending operation of the past 17 years because of all the new loans made since 1931, not a single one has resulted in acquired real estate and we have no loans in foreclosure now. We could perhaps feel proud of such a record and we could also be criticized for not taking enough risk. Some people say that if you don't foreclose some loans you are not lending enough on the others, and I would agree that is true under normal circumstances. But we feel that our record is not in the least way remarkable. Except for a brief hesitation in 1938 and 1939, all of these loans were made on a steadily rising price level. One should be able to make loans with his eyes shut and suffer no bad effects, if prices the next year are always higher.

We have analyzed much of our previous foreclosure experience on loans made prior to the depression and know about where the breaking point was in each locality where we operated, and keep those facts in mind as we approve loans. But as Dr. Engberg has pointed out we may have a different set of circumstances. The experience of those days may not be a good basis for judging the loans presently being made. I feel rather certain that we do not need to prepare for situations as bad as they were in 1931, 1932 and 1933. But the facts are that farm loans of the Equitable Society or, for that matter of any other lender, made in the last 17 years have not been tested, and the experience previous to that may not be applicable. We must, therefore, look largely to other fields for our guides. Our opinion is that the most important thing to watch now is the cost and price relationships developing and which seem likely to prevail in the various types of farming, various commodities and for the various areas.

Dr. Engberg has spoken at some length regarding the proposals for farm mortgage insurance and other pooling arrangements. I am perhaps not so conscious of a need for such arrangement because the farm mortgage business is a relatively small part of Equitable's investment activity, and bad experience in the Farm Mortgage Department would likely be more annoying than costly, in relation to the total investment. But in the same way that we shy away from one-crop farms because there is no diversity of risk, I can see that investors might shy away from strictly farm lending organizations because of a similar lack of diversity, especially if their loans are concentrated in a rather small area. If there is a real hazard there, I hope that the Farm Credit Administration works out a suitable solution and that it is not done by the underwriting of the risk by the Federal Government.

As far as the local country banks are concerned, there is little need for many of them to take advantage of any federally sponsored appraisal organization or farm mortgage insurance similar to the FHA. Other methods of meeting the problem if there is one can be developed. For example, the Equitable Society has devised a method which relieves local banks of the technical appraisal problem and also the risk inherent in tying up large sums of money in rather slow moving farm mortgage paper. I refer

to the Approved Mortgage Plan which was originated and introduced by the Society a few years ago. By this plan banks originate the application, the farm is appraised by the Society's salaried appraiser, the title examined by the Society's attorney, the bank closes the loan and holds the investment for a two-year period, at which time it is assigned to the Society for the balance of the term. There are some special procedures followed to legalize the loan under the term limitations imposed by the National Banking Act and some of the State laws, and yet give the borrower a long term loan. After the loan is assigned to the Society, the bank continues to collect interest and principal payments and remit to the Society as its agent. More than a thousand banks over the country have entered into agreements with the Society on this plan and several million dollars of loans have been made. Many of the larger insurance companies have copied the plan.

Personally, I see no need whatever for a federally sponsored insurance program for farm mortgages. The term "insured loans" seems to have some magic about it that makes people think that the 85 to 90 percent loans so far successfully made on dwellings could be made just as successfully on farms if they were only "insured." There isn't anything about an insured loan that makes the interest easier to pay. In fact, the insurance feature is an added cost to the borrower. In my opinion, it would do farm borrowers no good whatever, and I believe that is Dr. Engberg's conclusion. As far as lenders are concerned, if they do not have the resources and know-how to make farm loans, I think they should stay out of the business, unless they choose to handle it on the basis of the Approved Mortgage Plan, or some similar arrangement that has hard money behind it. If an insurance program made credit more freely available to farmers, that perhaps is about the worst thing that could happen to them now. Credit is already too free, in my opinion.

We might examine for a minute just who would benefit by such a program and who wants it. I shall not name names, but if you will go back into the history on it you will find that it was originally sponsored by a group which has made a lot of money making FHA loans and selling them to investors. They visualize doing the same thing with farm mortgages. The result would be ownership of farm mortgage paper by widely dispersed uninformed lenders with little or no conception of the problems of administering defaults. As Dr. Engberg says, FHA insurance offers no protection to the borrower but, instead, puts a premium on prompt foreclosure. Some might say that the Farm Credit Administration or Farmers Home Administration could administer the defaulted loans and keep the investors happy by advancing the interest. In my opinion, that would be the beginning of the end for both private and truly cooperative farm credit in this country and a further decisive step toward social credit. I wish I could believe that we have heard the last of insured farm mortgages.

ROUNDTABLE ON FRUIT AND VEGETABLE MARKETING

Chairman: M. P. Rasmussen, Cornell University

NATIONAL CONSUMER PREFERENCE STUDY FOR POTATOES*

H. W. BITTING

Bureau of Agricultural Economics

THE national consumer preference study for potatoes sampled a universe of 23.7 million private households in cities of 2,500 and over in the United States.¹ In addition to giving national urban figures the sample was designed to give separate estimates for the South, the rest of the country excluding the South (called the "North" in the report), and three cities—Boston, Chicago, and Los Angeles. A total number of 3,306 interviews were taken. The interviewing was conducted during November and December of 1947.

It would seem logical to examine briefly certain considerations and the various phases of consumer research before reviewing the results of this study.

Coordination needed: Some degree of coordination in our consumer researches is desirable, so that each study may contribute to the others. Certain objectives can best be attained through the use of personal interviews, others by controlled retail store experiments, or by consumer panels, or by mail questionnaires, personal observation, etc. In most cases a combination of these methods or some of them, would be the most efficient way to drive toward the desired objectives. No one method is best for all purposes. Each can make a contribution to particular objectives.

Value to producers and consumers: Consumer research studies should assist in reflecting price differentials to growers for the goods

* A paper given at the Annual Meeting of the American Farm Economic Association, Green Lake, Wisconsin, September 15, 1948.

¹ The research on which this report is based was made possible by funds provided by the Agricultural Research and Marketing Act of 1946.

The Bureau of Agricultural Economics assumed major responsibility with cooperation and advice from the Bureau of Human Nutrition and Home Economics, Farm Credit Administration, Production and Marketing Administration, and representatives from the technical committees representing the Agricultural experiment stations in four regions.

and services consumers want most. Through them, and through adequate follow-up work and adjustments, producers would be afforded an opportunity to maximize their returns and consumers could be provided with the goods and qualities and services they want and can pay for

Consumer research may be roughly divided into three categories: I. Studies of buying behavior under existing conditions based upon observation and historical data, II. Studies dealing with preferences, attitudes, and opinions; III. Studies designed to evaluate preferences under controlled experiments.

I. Buying behavior under existing conditions

These studies represent the usual type of consumer study where consumer buying behavior is observed under existing conditions and sales data are recorded. Such information is useful for purposes of forecasting sales. It can be combined with controlled experiment studies to provide a base from which to forecast possible sales when conditions resembling the controlled conditions prevail generally. The observation of buying behavior alone affords no assurance that consumers were given a chance to buy the goods and services they wanted most.

II. Preferences, attitudes and opinions

There is some information which can be obtained only by going directly to the consumer. Personal interview, mail questionnaire and consumer panel methods are designed to elicit information from consumers. They are particularly adapted to learning: (a) Reasons for non-use or limited use of a commodity, (b) the extent to which consumers are able to obtain the goods, qualities and services they want most in the form in which they want them, (c) the relationship between consumer preferences and the various factors which affect these preferences such as income, age, size of family, type of work, nationality, etc., and (d) probable preferences for new products in relation to competing products or preferences in regard to new grades or new packaging of an item.

It is essential that proper sampling methods be employed in obtaining consumer preferences. It is only through proper sampling that we can estimate errors and estimate the reliability of our results.

III. Controlled experiments

Stated preferences made by consumers may have limited influence on the market because the consumers may not be able or may not be willing to pay the price required. Therefore, controlled experiments are needed to evaluate consumers' stated preferences in terms of prices paid and quantities purchased.

*Findings of the National Consumer
Preference Study for Potatoes*

The national consumer preference study for potatoes typifies consumer research described under Category II. One of the objectives of this study was to discover the variation in potato consumption with respect to geographical areas and income levels, as well as the factors associated with these variations.

It was found that consumers in the South had the lowest potato consumption. According to the responses given they consumed 2.0 pounds weekly per person exclusive of infants under 9 months, compared with 2.8 pounds for "the North," and 2.7 pounds for the U. S. average. Factors associated with lower potato consumption in the South include a higher percentage of homemakers reporting the use of rice, sweetpotatoes, grits, and corn meal mush.

TABLE 1. AVERAGE PER CAPITA CONSUMPTION OF POTATOES AND PROPORTION OF HOMEMAKERS THAT REPORTED THE USE OF SPECIFIED PRODUCTS AS SUBSTITUTES FOR POTATOES FOR SPECIFIED AREAS, NOVEMBER AND DECEMBER 1947

Areas and cities	Per capita consumption of potatoes for week prior to interview	Proportion of homemakers reporting the use of specified products as substitutes for potatoes							
		Macaroni, spaghetti, and noodles	Rice	Dry beans, peas, and lentils	Sweet-potatoes	Bread, pancakes and waffles	Green and leafy vegetables	Grits, corn meal mush	Other vegetables
	Pounds	Percent							
<i>Areas</i>									
U. S.	2.7	77	48	19	11	10	10	9	8
"North"	2.8	80	42	19	10	11	11	5	8
South	2.0	61	72	17	16	7	7	27	9
<i>Cities</i>									
Boston	2.8	84	24	29	6	9	10	1	6
Chicago	2.3	75	44	19	12	23	10	5	8
Los Angeles	2.4	74	55	24	12	10	12	4	15

According to Table 1, even though macaroni, spaghetti, and noodles were more frequently mentioned than other potato substitutes

they apparently displace potatoes to a lesser degree than do rice, sweetpotatoes, grits, corn meal mush, and other vegetables.

The major reasons given for using particular foods as substitutes for potatoes were (a) they add variety to the meals, (b) they taste good and the family likes them, and (c) they are a good source of starch.

For the United States, consumers in the low-income group reported an estimated weekly average potato consumption, per capita, of 2.8 pounds compared with an estimated 2.6 pounds for consumers in the middle-income group and 2.5 pounds in the high-income group. A similar relationship held true in each of the regional and city comparisons.

Another objective of the potato preference survey was to learn whether consumers might not be able to get the potatoes they want in the form they want them. The factors which consumers said they considered most important were quality, size, and price. Of these, homemakers said that quality in potatoes was preferred above the others, size was next in importance, and price was third.

There was some indication that consumers were unable to get the quality of potatoes they desired. Fifty-one percent of the interviewed household consumers in the South mentioned as objectionable defects in potatoes purchased soft spots, rotten on the outside, wrinkled, shriveled, or old looking. Only 30 percent of the interviewed consumers mentioned any one of these defects in the North. Well over half of the interviewed homemakers in the United States said some of the potatoes they bought in the fall of 1947 had interior faults. A like proportion of homemakers so reported in the areas tabulated separately.

Dark streaks were specified more frequently as a defect than any other by the homemakers in the areas tabulated. Southern homemakers mentioned hollow centers and internal decay more often than did those in the North; the northern homemakers cited "cooking up black" more frequently than did those in the South.

It would appear that consumers are not able to buy the exact sizes they prefer. Questions as to size preferences were answered in relation to the consumers' use of potatoes. Fifty-eight percent of these homemakers interviewed reported that they buy all-purpose potatoes only. An additional 30 percent reported they buy an all-purpose plus one special-purpose potato. The special-purpose potato was predominantly a large potato chosen primarily for baking.

Of the 88 percent of the consumers reporting buying all-purpose potatoes, 81 percent preferred medium-sized potatoes for general use. Only 60 percent reported they purchased a medium-sized potato. Eight percent of the consumers who said they buy general-purpose potatoes said they preferred mixed sizes, but 26 percent reported usually buying mixed sizes. Forty-six percent of consumers buying mixed sizes said that they did so because packaged potatoes come in mixed sizes.

When quality is good and prices are low, 20 percent of these consumers reported that they buy more potatoes. However, 90 percent reported that price was not a factor in their use of potato substitutes.

In order to learn the extent to which consumers' inability to obtain the quality and size of potatoes they prefer affects potato consumption, it will be necessary to evaluate these preferences in terms of prices paid and quantities bought. This will require controlled experiments or the use of pantry inventories at the time of personal interviews, after the desired quality and size of potatoes have been made available in the retail stores.

There appears to be no one best way to market potatoes. According to this study 64 percent of the consumers interviewed said they preferred buying their potatoes from open bins, whereas 17 percent said they preferred packaged potatoes, 16 percent reported no preferences, and 3 percent were not ascertained. In general, consumers haven't a good place to store potatoes. Most of the consumers said they preferred medium-sized potatoes. With this preference in mind it would appear advisable to market all medium-sized potatoes, find special outlets for large-sized potatoes, and leave the small ones at home except when demand is sufficient to cover marketing costs.

Further research needed: What are the survey findings that point to further action and research by the potato industry? The need for evaluating preferences for potato quality and sizes in terms of quantities bought and prices paid has been indicated. The survey also revealed that these consumers think they want potato grades clearly marked on the bins, bags, and packages apparently to guide them in selecting better quality, even though these consumers were not fully informed as to the meaning of the grades. The survey revealed that people generally have not thought of buying potatoes for specific uses other than for baking. This suggests investigating the possibility of packaging and marking some potatoes for par-

ticular uses. One of the reasons given for using potato substitutes was "They add variety to the meals." This suggests acquainting some consumers with a greater variety of ways of preparing and serving potatoes. Although these consumers were rather generally aware that potatoes are a valuable source of starch, they were not fully informed as to the other food values of potatoes. This suggests acquainting consumers with food values other than starch to be found in potatoes.

Summary

In general consumers said they wanted medium-sized potatoes bright in appearance with smooth skin, clean surface, few and shallow eyes and no spots or blemishes. Quality was the one factor they wanted most. Apparently to insure quality they preferred to select their potatoes from bulk and also to have grades marked on bins, bags and packages. They wanted their potatoes to be free from hollow hearts and dark streaks and lumps when cooked. They preferred one all-purpose potato which would cook up mealy, evenly and soft throughout without falling apart.

THE NORTH-CENTRAL STATES REGIONAL POTATO MARKETING PROJECT CONTROLLED RETAIL STORE EXPERIMENT*

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The Quality-Price Relationship of Potatoes at the Retail Level

THE Technical Committee for the North-Central States Regional Potato Marketing Project decided to confine activities during the 1947-48 season to an appraisal of retailer and consumer reactions by means of controlled retail offerings of potatoes graded to special experimental specifications and uniform size standards. With one exception the sizes chosen conform to those promulgated in the USDA Consumer Standards for Potatoes effective December 8, 1947. The committee felt it would be advantageous to use a $1\frac{1}{8}$ inch rather than a $1\frac{1}{2}$ inch minimum size during the experiment. Therefore, the potatoes were graded U. S. No. 1 and sorted into three sizes: $1\frac{1}{8}$ to $2\frac{1}{4}$ inches; $2\frac{1}{4}$ to 3 inches; and 3 to 4 inches. These sizes were called Small, Medium, and Large. Each car contained potatoes from the same lot which were not sorted into the various sizes. These potatoes were called Not-Sized and were used as a check on the sized tubers.

The tubers were selected from representative lots of Bliss Triumph potatoes produced in the cooperating states. The Nebraska, North Dakota, and Minnesota committee members arranged for the washing, grading, sizing, packing, and shipping. Eleven cars were used in the experiment and were displayed in the stores from January 5 to March 20, 1948.

The Production and Marketing Administration cooperated on the project by inspecting the potatoes of each size class in each car for quality and condition. Inspections were made at shipping point, in the receiver's warehouse, and in the retail stores to secure data on grade, damage, and injury at successive stages during the marketing process. Four times the amount normally used for an inspection was examined. The potatoes were rated in the retail stores by the inspector and the University representative according

* A paper given at the Annual Meeting of the American Farm Economic Association, Green Lake, Wisconsin, September 15, 1948.

to condition and appearance. The general appearance of the display was also rated.

One car was shipped every week and arrived in Chicago in time for the potatoes to be placed on sale Monday morning. Arrangements were made with the stores to display only the potatoes from the latest car in order to maintain quality and so that sales would reflect the size-price relationship rather than quality-price relationship. The displays were renovated during the week by the store personnel according to their usual merchandising practice.

The Small, Medium, Large, and Not-Sized potatoes were displayed side by side on racks or tables. Each size occupied the same amount of display space and the same quantity of each was offered for sale. Bliss Triumph were the only red potatoes on display in two chains. McClures were offered for sale in addition to Bliss Triumph in the other two chains.

The store personnel kept the data on sales and discounts. The PMA personnel assisted the University representative in securing data on shrinkage and freezing.

Specific objectives varied between the chains. In Chains A and B prices were adjusted in order to secure an equal volume of sales of all sizes. In Chains C and D prices were set to secure volume of sales by size in the same ratio as the potatoes were produced. The prices for the various sizes were the same during the first week of the experiment in each chain. They were then adjusted in order to secure a volume of sales in line with the desired objective. Retail prices were set each week upon consultation with the chain store officials. The basis of pricing was to sell the Not-Sized at cost plus usual mark-up and to sell the sized potatoes so that the average price per pound would be the same as for the Not-Sized.

A consumer interview phase was conducted in cooperation with the Bureau of Human Nutrition and Home Economics. A representative of the Bureau interviewed purchasers of potatoes in the stores used in the experiment of one of the chains at various intervals from February 28 to the close of the size-price experiment on March 20. From then until May 1, customers in chain and independent stores in several parts of the city and its suburbs were interviewed.

A survey of potato merchandising practices in Chicago retail stores was conducted in cooperation with the Bureau of Agricultural Economics. Interviews were secured in 520 stores that handle

fruits and vegetables. These stores were selected at random from a listing of all such stores in the city.

Preliminary analysis of the data secured indicate that the Small potatoes will outsell or equal the sales of the Not-Sized when the price of the Small is 85 percent or less of the Not-Sized. The sales of the Medium will exceed those of the Not-Sized until price of the Medium exceeds the price of the Not-Sized by 15 percent. Sales of the Large were as great in relation to the sales of the Not-Sized when prices were 15 percent above as when the price was five percent below. This indicates that some people want large potatoes and will pay a premium to get them.

The specific objectives of securing an equal volume of sales of all sizes was fairly well achieved in Chain A during the last week. During the first week when prices for all sizes were the same, 5 5 cents per pound, the percentages of sales were Small 12.9, Medium 39.5, Large 29.9, and Not-Sized 17.7 percent, but during the last week when prices were 5.3 cents per pound for the Small, 6.3 cents for the Medium, and 5.9 cents for the Large and Not-Sized, the sales were Small 22.3, Medium 24.9, Large 25.1, and Not-Sized 27.7 percent of total sales. During this week when sales were approximately the same the price of the Medium was 0.4 cent per pound above the Large and 1 0 cent per pound above the Small. The price of the Large was 0.6 cent per pound above the Small.

The objective in Chain C and D, selling the three sizes of potatoes in the same ratio that they were produced, was fairly well achieved in Chain C during the next to last week. Sales in comparison with total sales of the three sizes were 12.6 percent for the Small, 76 4 for the Medium, and 11.0 percent for the Large. The shipping ratio was Small 17.3 percent, Medium 74.7 percent, and Large 8.0 percent. Prices during this period were 6.2 cents per pound for the Small and Large, and 5.4 cents per pound for the Medium. During the first week, when prices were the same, the proportion of sales was 23.2 percent for the Small; 52.3 for the Medium; and 24.5 for the Large.

During the last week prices were changed to 6.6 cents per pound for the Small and Large and 6.2 cents for the Medium. The ratio of sales changed to 25.1 percent for the Small; 56 8 percent for the Medium; and 18.1 percent for the Large. Thus, when the prices per pound of the Small and Large were increased 0.4 cent per pound from 6.2 cents to 6.6 cents, and the Medium 0.8 cent from 5.4 to

6.2 cents, the proportion of Small and Large sold increased, and the sales of Medium decreased from 76.4 percent of total sales of the three sizes to 56.8 percent.

Data were secured from one chain on total potato movement in nine comparable stores to determine representativeness of the stores used in the experiment and the effect of experimental tubers on potato sales. Potato sales were greater during the experiment in the three stores used than in the nine similar stores. In the experimental stores a significantly greater quantity of red potatoes was sold than white, but in the similar stores the quantities of the reds and whites sold were practically the same. In another chain data were secured on total potato sales in the three stores used in the experiment and in all other stores in the chain. A comparison of sales showed the three stores to be representative of the chain. Total potato sales were not increased in the three stores used during the experiment compared to all stores. However, the sales of red potatoes were maintained at a higher level than the whites in the experimental stores. The sale volume of red potatoes compared with white in all stores of this chain was almost identical during the experiment.

An analysis for variance shows that the variance between selling period, carload, and distributor and size of potatoes did not differ significantly from the variance for error. The consumer preference remained fairly constant from week to week except as influenced by change in prices. Between distributors the variance was slightly higher than the variance for error but too low to have any significance. The difference in consumer preference between stores was not constant.

Several factors which would affect potato sales were shown on the inspection certificates. The shipping point inspections revealed considerable variation in defects among the different sizes. The damage due to bruising increased slightly with the large tubers. The average percentage of bruised potatoes listed as injury also increased as size increased. Occurrence of other defects varied little between sizes.

The receiving point inspections showed a considerable increase in injury per car from shipping point to warehouse, and that the injury increased as the size of tuber increased. Air cracks were not apparent at loading time, but the warehouse inspections showed air crack damage. Retail store inspections indicated that the number of defects increased as the size of tubers increased. The principal

defects causing the increase were shatter bruises, air cracks, and light burn.

The consumer interviews were sorted according to the number in the family over one year of age. Except for families having one and six members per family, the purchase of Medium potatoes increased as size of family increased. Approximately one-half the purchasers indicated that they were not concerned with price because they had not noticed the price differentials. There was no apparent relationship between price and size of family. More than 82 percent of the purchasers interviewed from March 20 to May 1 said they always bought potatoes of the same size. With the exception of the one-member-per-family group, which preferred smaller units, five to six pounds was the most frequent quantity purchased.

The executive committee has approved the following plans for the 1948-49 year: (1) Use three stores of one chain at a time in various areas of Chicago; (2) Use potatoes of the same three sizes as in 1947-48; (3) Use potatoes from one source during one period; (4) Omit check lot; (5) Use nondifferential prices during the first week for each variety.

QUALITY FACTORS AFFECTING THE PRICE OF PEACHES ON THE BENTON HARBOR MARKET*

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PEACH prices fluctuate widely. The fluctuations which are caused by changes in the general price level, size of the crop, and volume of marketings can be controlled very little by the individual producer. The purpose of the study was to determine the amount and causes of price variations which are due to factors within the control of the grower.

The study was made on the Benton Harbor Wholesale Fruit Market because of its large volume of business, and because sales are made by personal inspection. About 1,300,000 bushels of peaches or 28 percent of the Michigan Crop were sold on this market in 1947. Sales on the market are made on an individual basis with the buyers and the individual growers bargaining to reach an agreeable price.

The scope of the study was limited to the Halehaven and Elberta varieties which made up about 78 percent of Michigan production in 1947. The study was further limited to those peaches marked U. S. No. 1, 2 inch and up. This size and grade included most of the peaches marketed on the Benton Harbor Market.

Data for the study were gathered between September 1 and September 23, 1947. This period included the peak marketings of both varieties of peaches. To gather the data the enumerator mingled with the buyers and recorded observations on the various loads of peaches as they were sold. The peaches were rated on general appearance, firmness, defects, percent of red color, and the shade of red and green color. The size of the load, type of package, time of sale, the location of the seller on the market, and other factors which were thought to influence prices were also recorded. Observations were made of those baskets opened by the buyers.

Results

The appearance of peaches was found to be the most important factor causing price variations within grades at any given time.

* A paper given at the Annual Meeting of the American Farm Economic Association, Green Lake, Wisconsin, September 15, 1948.

Halehavens with fair appearance brought 24 cents per bushel less than those with good appearance, and 37 cents per bushel less than those with excellent appearance. In the Elberta variety the differences were not as great, but they were significant.

Several factors were found to be associated with general appearance. One of the most important of these was the improved appearance due to the presence of shredded paper or cellophane on the face of the peaches. Appearance also improved as the percent of red color on the peaches increased. In the Halehaven variety any increase of red color over 50 percent seemed to make no improvement in appearance, while the increase of red color improved the appearance of the Elbertas throughout the entire range observed. Brushing the peaches improved appearance. It was more important in the Elberta variety, which normally lacked color. The shade of red or green had no effect upon general appearance.

Firmness or ripeness had a significant effect upon the price. In the Halehaven variety soft peaches brought 26 cents per bushel less than very hard ones when appearance was fair, and 12 cents per bushel less when appearance was good. When appearance was excellent the price differences were not significant. During the 1947 season, 46 percent of the Halehaven peaches marketed were very hard, 46 percent firm, and 8 percent were soft or very soft. Since very hard Halehaven peaches brought the best price, about one-half of the peaches studied may have brought better prices had they been marketed earlier. Most of these Halehavens had ample size and color to have been marketed earlier.

The effect of firmness was different in the Elberta variety. When appearance was excellent, firm peaches brought about 16 cents per bushel more than very hard peaches. There were no significant price differences due to firmness in fair or good peaches. Elberta produces marketed 93 percent of their excellent quality peaches at the very hard stage. This indicates that many of these growers might have received a better price if they had marketed later. It is also possible that some of the Elberta peaches with fair and good appearance may have attained excellent appearance had they been allowed to mature.

Defects caused significant price differences. Their greatest effect was found in the peaches in the poorest appearance classes. Bruises were the most costly defects while knots and other defects that detracted from appearance also caused lower prices. In general, the

buyers were most critical of the peaches with defects that might impair shipping quality.

Percent of red, brushing, and the use of shredded paper on the face of the basket, affected prices through their effect on appearance. Shade of red, shade of green, fullness of package, and type of package had no effect upon price. Some of the difficulties of measuring the associations between factors related to general appearance and price will be discussed later.

Both varieties of peaches were grouped together to study price variations due to imperfections in the market. For this analysis such factors as time of sale, type of buyer, and position on the market were observed. It was found that farmers who sold their peaches after four p m on days the market price movement was up received higher prices. Peaches brought better prices in positions near the market entrance when the price movement was steady. This was due to the different actions of the buyers on different days. Other market-factor variations were found to have no significant effect on price.

Methods of Analysis

The analysis was made with International Business Machines. To remove the effect of seasonal price variation, each sale price was compared with the daily average price taken from the Federal-State Market News Service reports. All tabulations were made using these variations from daily average price.

Sorts were made on all factors that were thought to have an effect on price, and the variations from the average prices were tabulated for each group. Where the tabulations indicated possible price differences due to the sort factors, the results were tested for significance. For this test, an adaptation of the analysis of variance known as the F test was used. Significance was determined by comparing the variance between groups with the variance within groups. Since there were unequal numbers of cases in each group, it was not possible to use the F test on all subsorts. To overcome this difficulty all factors were first sorted on the basis of appearance, and subsequent analyses were made separately within each of the three appearance classes.

To prevent the reporting of results that may have been due to chance, only differences significant at the five percent level or below were used. Most of the reported findings were significant at one percent.

The Chi-square test was used to measure association between appearance and other factors. It was not possible with this test to show the percentage of variance in appearance due to variance in the observed factors. If factors such as appearance, presence or lack of shredded paper, color, and fullness of package could be assigned accurate numerical values, correlations would have been used to determine these percentage relationships. The problem of assigning accurate numerical values to such factors as those mentioned is one that would seem to merit more study. It is a problem that is common to all quality-price studies, and especially those in fruits and vegetables.

In this study the tests of significance were most useful. Without them several apparently significant quality-price relationships would have been reported as being significant except for the fact that tests showed they could have been due to chance. The weeding out of relationships of questionable significance made it possible for the authors to be a great deal more specific in their statements than would otherwise have been the case. It also protects the user of the results.

DETERMINING CONSUMER PREFERENCES FOR SWEET POTATOES: METHODS AND RESULTS*

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EXAMINATION of marketing problems under investigation at land-grant colleges indicates that most research workers have given relatively little attention to studies of consumer preferences for agricultural products. These workers often have overlooked the fact that buyers with market baskets are a source of information that can be useful in improving the marketing system. Buyers also have been ignored by farmers and representatives of marketing agencies who tend to rely on their own personal opinions and hunches in evaluating the wants of consumers. In fact, considerable wishful thinking and rationalization have characterized the views of the produce trade on matters of consumer preferences.

It is being recognized, however, that the likes and dislikes of the homemaker, her opinions and prejudices, and the amount of money she has in her pocketbook, all are important items in determining the merchandizing methods used and the products bought. In buying any product the homemaker is confronted with the need for making decisions. These decisions, among other things, are affected by degree and kind of packaging, prevailing prices, and extent to which other products may be substituted. The question arises then as to methods which should be used in obtaining an objective measure of consumers' preferences as a first step in developing a merchandizing system for specific farm products.

Methods

Attention in this paper is directed primarily to methods used and results obtained in a study of consumer preferences for sweet potatoes conducted at the North Carolina Agricultural Experiment Station.¹ Reference also is made to somewhat similar studies conducted by Professor J. M. Baker of the Louisiana Agricultural Experiment Station.²

* A paper given at the Annual Meeting of the American Farm Economic Association, Green Lake, Wisconsin, September 15, 1948.

¹ Martin Abrahamson, Tech. Bul. No. 82, *Consumer Preferences for Sweet Potatoes*, N. C. Agr. Exp. Sta., Feb. 1947.

² J. M. Baker, Bul. 409, *Consumer Preferences in Sweet Potatoes*, Jan. 1947 and Bul. 422, *Marketing Louisiana Sweet Potatoes in Pittsburgh*, Sept., 1947. Louisiana Agr. Exp. Sta.

In planning the study consideration was given to devising means for objectively measuring consumer choice. Attention was given to the development of techniques for controlling the quality of the sweet potatoes used in testing preferences. It was recognized, however, that matters of interview procedures and sample techniques also were especially important in the successful prosecution of these studies.

Quality Control Techniques. In developing techniques to be used in conducting the study and as a means for testing the reliability of the information obtained, arrangements were made to make a trial run in an "experiment store." Four sales methods were tried. They were: (1) Giving buyers free access to various grades of sweet potatoes and permitting them to select those they desired, (2) selling graded sweet potatoes in three and five pound mesh bags, (3) permitting buyers to indicate the grades they desired and then having an attendant select potatoes as they came so as to maintain uniformity of size and quality, and (4) selling sweet potatoes according to size—small, medium, and large.

With the exception of the last method in which only U. S. No. 1 sweet potatoes were sold, all other test methods included the sale of four different grades of sweet potatoes. They were: (1) U. S. Extra No. 1, (2) U. S. No. 1, (3) U. S. No. 2, and (4) Unclassified or "warehouse run." These grades of sweet potatoes were priced at 11, 9, 7, and 5 cents, respectively. Prices were established in consultation with produce dealers and were believed to give a quality and price relationship that was in accordance with conditions prevailing at that time. All sweet potatoes used in this study were graded by official inspectors of the State Division of Markets.

After these methods of sale were tested, the following conclusions were reached:

1. In testing preferences, consumers were not allowed to select their own sweet potatoes even though this was the common procedure followed in retail stores in the State. To permit such a practice would result in progressive deterioration of the quality available. Under these conditions, buyers would tend to select the best sweet potatoes and it would not be long before the remaining ones would be out of grade and the price-quality designation established for purposes of study in effect would be meaningless. Furthermore, if attendants attempted to force these out-of-grade, poor quality,

sweet potatoes on the buyers, many would try to shift to other stores or would forego purchasing sweet potatoes altogether.

2. Selling sweet potatoes in mesh bags permitted adequate control of quality. This procedure, however, represented such a radical departure in established retail practices that most consumers were hesitant to make purchases. Many buyers expressed the belief that they often had been "stung" in buying sweet potatoes and they had no inclination to buy a "pig in a poke."

3. Selling sweet potatoes on the basis of size proved feasible. These tests, however, were postponed to a later date in order that information as to grade, price, and quality relationships could be obtained.

4. The practice of having buyers indicate grades and then arranging for an attendant to select, weigh, and mark the price for these potatoes gave indications of assuring the maintenance of quality. This method of sale, therefore, was chosen as the best one for conducting the study.

Facilitating Practices After the most satisfactory sales method had been determined, the following practices were adopted to implement this method:

1. After arranging with store managers to conduct this study, research workers of the Department of Agricultural Economics took full charge of the sweet potato section of the produce counter in these stores. Full responsibility was assumed for obtaining sweet potatoes of the desired grades, for arranging to have them in the store on the date of sale, for setting up counter displays, for keeping all bins supplied, and for waiting on customers, including selecting potatoes, weighing them, and marking the total charges on the bags.

2. Sweet potatoes were displayed in four consecutive bins on the produce counter at six markets and in bushel baskets at two of the smaller stores. The order of display was changed each day so as to allow for whatever influences location might have on the preferences expressed by consumers. Variations in grades, furthermore, were brought into focus by order of arrangement. During a given period, for instance, U. S. Extra No. 1's were placed next to the Unclassified sweet potatoes. The order of the four grades being as follows: (1) U. S. Extra No. 1, (2) Unclassified, (3) U. S. No. 1, and (4) U. S. No. 2.

3. Consumers were interviewed during two days in each of the stores selected. The accepted practice was to work in one store on Friday and Monday and another store on Saturday and Tuesday. This permitted recognition of differences that might prevail because of the time of shopping. For example, buying habits of individuals who bought on the first of the week might differ from the habits of those buying on weekends. All tests were conducted during the months of February and March.

4. Consumers were interviewed only after making a purchase. It was not until they were handed their bag of sweet potatoes by the attendant that their attention was called to the fact that a representative of the Experiment Station (located in an inconspicuous place) would like to talk with them about their sweet potato buying practices.

5. An effort was made to interview all consumers purchasing sweet potatoes. This was possible except for a limited number of purchasers on weekends (perhaps not over 20 percent of the total) who could not be interviewed because of the concentration of buying during certain hours.

6. For the purpose of testing the frequent assertion that prices were of no concern if quality of sweet potatoes were available, permission was obtained from the OPA to increase prices of U. S. Extra No. 1 from 11 to 15 cents per pound for supplementary tests in Raleigh and Asheville.

Results

The results of this study were obtained by using the produce counter as a laboratory for measuring buying practices under actual market conditions. Emphasis here is directed to findings that show the relationship of income to the amount and the quality of sweet potatoes purchased.

Consumers were grouped into three classes: those earning less than \$100 per month, those earning \$100 to \$199, and those earning \$200 and over. Findings showed that weekly per capita purchases in the lowest income class were highest and averaged 1.6 pounds. This compares with a low of 1.1 pounds in the highest income class. In other words, consumers in the low income class purchased 45 per cent more sweet potatoes than did the high income group. These findings support the common observation that the sweet potato is a "poor man's food."

With respect to quality, 28 percent of the sweet potatoes purchased by the lowest income families were U. S. Extra No. 1 and 37 percent were U.S. No. 2. This compares with the highest income group in which 65 percent of all purchases were U. S. Extra No. 1 and 8 percent were U. S. No. 2. (In general similar results with respect to grade preferences were obtained by Baker.)

Findings of this study indicate that in the years ahead sweet potato producers would benefit by giving greater attention to: (1) producing the types and varieties desired, (2) following better grading practices, (3) encouraging the development of a system that establishes prices in accordance with the quality produced, and (4) finding ways of increasing the over-all efficiency of the marketing system.

This study also has important implications for the wholesale handler and retail merchant. Once the buying practices and consumption habits of consumers are known, market agencies have the responsibility of taking steps to provide the grades, varieties, and qualities that are in accordance with the preferences of the trade. They also can contribute to the development of better sweet potato marketing methods by establishing a pricing system that adequately reflects variations in the quality purchased and sold.

ROUNDTABLE ON OUTLOOK INFORMATION

Chairman George Montgomery, Kansas State College

USE OF OUTLOOK IN AN EXTENSION PROGRAM*

L. C. CUNNINGHAM

Cornell University

WITH such a topic assignment, one might either discuss what should be the use of outlook in an extension program or give an experience even at the risk of bragging. I shall exercise reasonable restraint and present our experience in New York State. I know that other states have made effective use of outlook in their programs but perhaps more justice is done if they tell their own story. Even though limited to one state, actual experience should be more worthwhile than theory or speculation, and perhaps it will serve as a more suitable basis for the group discussion which is to follow.

This discussion will include the use of outlook in both the Agricultural Economics Department and College Extension Programs.

In the Agricultural Economics Department program, outlook occupies an important place. Our activities for the past year may be used as an illustration. Following the National Outlook Conference in Washington, staff members in the department who are responsible for the outlook work assemble the pertinent statistics relative to the general price outlook, to costs in farming, and to each of the important commodities in the State. These data were the basis for a thorough discussion by this group of the general outlook and of each important commodity. The tables and graphs were assembled in a report called the "Economic Handbook, 1947-48." After our own Department staff discussion, members of other departments in the College were invited to review the statistical background for the outlook for the different commodities. And following these sessions narrative reports were prepared which became the manuscript for the "1948 Outlook Bulletin." This was printed in an edition of 100,000 copies for general distribution among farmers and others in the state.

Equipped with this Economic Handbook, slides and wall charts and advance copies of the outlook bulletin for use as teaching

* A paper given at the Annual Meeting of the American Farm Economic Association, Green Lake, Wisconsin, September 15, 1948.

materials, we held a state-wide economic conference for county agricultural agents in early December. This conference set the stage for activities at the county level, including a limited number of county and community meetings as such, the use of some outlook as introduction to other meetings and the distribution of the bulletin with a covering letter by the county agent. This launching of the outlook work is followed up from time to time during the year with general and individual commodity outlook statements.

In the College Extension Program, the work is carried on along commodity or type-or-farming lines. Specialists from departments directly concerned serve on committees for dairy, poultry, fruit, and the like. To illustrate further, the college dairy committee makes a dairy program at the state level to serve as a guide to the county dairy committees in making their programs at the county level. The dairy program for last year contained a section on the general economic situation and outlook as well as sections on the major dairy farm problems and the suggested educational activities and services available. The place of outlook in these commodity programs is not so much merely to include a brief statement on outlook as to keep the programs in tune with economic conditions. For example, in 1947, the outlook indicated a continuing shortage of milk in the fall season. Consequently, major emphasis was placed on this problem. Again, the Dairy Barn Management Program which is in its second year was initiated partially in view of the economic outlook for farm labor.

In summary, the use of outlook occupies an important place in the extension program in Agricultural Economics. Its primary objective is to give to farmers the facts on which they may make their individual decisions. The use of outlook in the College commodity programs is becoming of increasing importance. The principal objective here is to give major emphasis in the extension program to those problems that are highlighted by changing economic conditions

OUTLOOK AND FARM MANAGEMENT*

L. F. MILLER

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OUTLOOK work has been linked closely with farm management from its very inception. This was made clear by the Secretary of Agriculture's report for 1923 covering the inauguration of this work in the Department, which stated that, "Producers need information to guide them in making proper adjustments between the acreage planted to various crops."¹ From that time forward outlook reports and farm management specialists have consistently emphasized the importance of providing farmers with information which would form a basis for adjusting production to future market conditions.

In view of this quarter century of outlook work it may be surprising to find in the literature considerable variation in the interpretation of just how outlook does fit into the farmer's problem of adjusting his business to changing economic conditions. Over the years farm management specialists have come to stress different uses of the outlook, depending largely on the basic character of the agriculture with which they are most familiar. It is not difficult to imagine, for example, the variations in emphasis that would be made by a farm management specialist working with general farmers in Iowa as contrasted with specialized dairy farmers in Vermont.

Because such sectional variations in emphasis may tend to narrow individual concepts of outlook work, it appears desirable to outline the major contributions that outlook can make to the successful operation of the farm business. The following categories are neither all inclusive nor mutually exclusive, but they do provide a needed framework for a broad perspective on the relation of outlook to farm management.

(1) Outlook information may be helpful in dealing with the short-run problems of timing both the sale of outputs and the purchase of supplies. This is often termed "Market outlook," since it is assumed that the physical and economic problems of production are largely past and the problem is now one of timing sales. With

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¹ Annual report of the Department of Agriculture, June 1923, p. 23.

certain types of farming this may be a highly important kind of outlook work. Provided it is reasonably accurate, such information will most certainly prove popular since the financial benefits may be great in relation to the extra effort involved and since many producers doubtless feel less competent to deal with marketing than with production.

(2) Outlook information may be helpful in short-run and intermediate problems dealing primarily with the alternative use of existing resources. The need for these adjustments develops primarily because of comparatively short-run shifts in *relative* prices. The possible questions farm operators may legitimately ask in this field because of the changing outlook are almost infinite. Should I plant more soybeans this spring? How much finish should I put on my steers? How many sows should I breed this fall? These are but a few examples.

In connection with these first two uses of outlook information the following questions might be raised for discussion purposes. First, is there any danger of overemphasizing this type of work to the possible detriment of such fundamental farm management factors as the scale of operations, the basic organization of the business and the over-all efficiency of production? Second, has adequate recognition been given the possible ramifications and effect on the individual's total farm income of suggested adjustments in line with the general outlook? What appears to be a highly desirable adjustment in view of prospective prices may not look so promising after we have appraised its possible effect on total farm operations and on labor income. The efforts to get farmers to develop production plans which call for marketing their product when prices are usually seasonally high is a case in point. As Professor Black points out "But it is always possible to produce for these high-priced markets at an increase in cost which is more than the increase in price. Probably only the more successful farmers who feed the better rations, who have the better-bred livestock, and who house and care for them better than the average farmer, can obtain 'out-of-season' production at low enough costs."²

(3) Outlook information may be helpful in cyclical and longer-run problems dealing primarily with desirable adjustments in the basic organization of the business and with the scale of operations. These adjustment problems stem from cyclical changes in the general

² Black, Clawson, Sayre, and Wilcox, *Farm Management*, 1947, p. 462.

price level or from long-run secular changes in the demand and supply pictures for specific products rather than from short-run shifts in relative prices.³ Although the educational problem of getting outlook information used is not considered in these comments, it should be clear that giving more emphasis to the longer-run outlook does not in any way reduce the necessity for localizing suggestions to fit typical farming situations within a given area.

For many producers where the short-run alternatives are distinctly limited, information dealing with desirable adjustments in line with the longer-run outlook for specific products and for prices in general would be highly useful in long-range farm planning.⁴ Even in those areas where the emphasis tends to be on marketing and short-run production outlook because of the many available alternatives, the point might be raised regarding the need for relatively more effort on longer-run outlook. In this connection, the results of a survey conducted by Professor Mosher in 1936 on the use of agricultural forecasts by members of the Illinois Farm Bureau Farm Management Service are worth repeating—"While the majority of the best farmers, when answering the questionnaire, stated that they do make profitable use of agricultural forecasts, many of them emphasized the much greater dependence on a well-developed plan of crop and livestock production carried out consistently without much change from year to year."⁵

(4) Finally, outlook work may be helpful in developing a sound financial program for the farm family. In spite of the close relationship between a farmer's production and financial program, it is not safe to take the latter for granted simply because production adjustments have been made in line with the outlook. The character and amount of the farmer's various assets and liabilities may be the major factors in determining his ability to withstand economic reverses or to take advantage of a rising price level. Furthermore, the expenditures for the farm home have a direct bearing on the operation and financial position of the business. To be useful in this

³ The need for such periodic long-time appraisals and their relation to the annual appraisal of desirable production adjustments was pointed out by the *Report on Production Adjustment Research*, Farm Management Research Conference, Washington, D. C., November, 1946.

⁴ For a good discussion of the type of adjustments that may be made in response to changes in the general price level see Sherman Johnson and Associates, *Managing a Farm*, pp. 338-46 and Hart, Bond, and Cunningham, *Farm Management and Marketing*, pp. 384-88.

⁵ M. L. Mosher, this JOURNAL, February, 1937, p. 249.

connection outlook information should be geared to helping with such problems as the proper timing of capital investments and purchase of durable goods for the farm and home, and to appraising the family's financial balance sheet.

In the above outline, certain general questions have been raised regarding the use of outlook in farm management. No more could be done in the space available. In summary, these questions are: (1) has sufficient effort been devoted to the longer-run outlook and its effect on the total farm operation as contrasted with the shorter-run outlook and its emphasis on the alternative use of existing resources, (2) in both the short- and longer-run outlook, has adequate recognition been given to the fact that prospective prices are only one of the many factors that must be considered in arriving at a sound conclusion regarding the best production program for a particular farm, (3) and finally, have we given adequate attention to the need for longer-run outlook information that would be helpful in developing a sound financial program for the family. In other words, I believe we may still question the progress we have actually made on the next major phase suggested by H. R. Tolley in 1931 when he stated, "The next major step in the development of outlook work should, in my opinion, be to mobilize resources in a similar manner for work on other phases of the program *with major emphasis on determining farming plans and programs that will yield the highest returns in the years ahead* in the different agricultural regions of the country and developing ways and means of getting the results to farmers."⁶ Perhaps it has been a question of the alternative use of our professional resources, for if we seriously applied ourselves to the problem of determining desirable short- and long-run production adjustments by size and type of farm, we would be forced either to forego considerable research work now under way or to increase the number of workers in farm management. While those of us in the field probably would suggest an increase in numbers, a less biased source might point out opportunities for more work along the lines suggested above through a critical appraisal of the research now under way.

⁶ H. R. Tolley, "History and Objectives of Outlook Work," this JOURNAL, October, 1931, p. 534. Italics not in the original.

THE DEVELOPMENT AND USE OF ECONOMIC INFORMATION AND FORECASTS BY INDUSTRY*

DEAN McNEAL
Pillsbury Mills, Inc.

TODAY, industry makes more practical use of outlook information and economic forecasts than any other group. However, prior to recent years, many businessmen looked upon economic forecasts in much the same way that they regarded fortune-telling. Even today some businessmen feel that there is considerable hocus-pocus associated with forecasts, and that they must have their origin in a crystal ball.

This attitude is rapidly becoming the attitude of the minority. Most businessmen now realize that they have to make forecasts every day. When any businessman makes a decision on future policy, whether it concerns plant expansion, credit expansion, inventory controls, or any other aspect of his business, he makes a forecast. He first examines all the facts present in the current situation, eliminates all those which are not important to the decision, studies those which are important, and finally bases his decision on the results of these studies. This is exactly the procedure followed in making an economic forecast.

Those businessmen who now realize that they must make forecasts want these forecasts to be based on the best facts obtainable. Hence the demand from industry for outlook information.

Industry uses outlook information and forecasts as a basis for planning actions which, it is hoped, will result in greater profits. A forecast is of no value to business unless it becomes the basis for some action.

One other general point should be emphasized. In practically every case where a forecast is used, it is used to eliminate or minimize risks already inherent in a business. Seldom is a forecast used for the purpose of assuming an unnecessary risk.

Industry relies on outside sources for most of the economic information and forecasts which it uses. There are four principal outside sources:

* A paper presented at the annual meeting of the American Farm Economic Association at Green Lake, Wisconsin, September 15, 1948.

1. The Federal Government supplies much of this information. Those industries who supply farmers' needs or process farm products get much of their information from the Department of Agriculture and particularly the Bureau of Agricultural Economics.

The men in the Bureau of Agricultural Economics should be complimented on the excellent job they have done in recent years in preparing outlook information. In addition to supplying the public with economic facts, they also express their ideas as to what these facts may mean in terms of the future. This is a most valuable public service.

Industry also gets much economic information from other Departments of the Federal Government. Some of the more important are: The Bureau of Labor Statistics, the Department of Commerce, the Federal Reserve System, and the President's Council of Economic Advisers.

2. Another important source of economic information is Colleges and Universities. Information released by these Colleges and Universities can be classified into two types:
 - (a) Listing and discussion of facts important in the current economic situation. These are often accompanied by general forecasts.
 - (b) Analyses of the factors influencing the price and supply and demand for various commodities.
3. Industry gets much economic information from private research organizations. Some of these organizations are privately endowed, and the information is put out as a public service. Others are regular business concerns and sell their services to industry for a fee. In many cases, these private research organizations rely on the Government for their basic facts.
4. Probably the least important of the four principal sources is other non-competitive business organizations. Many banks, insurance companies, and other private business concerns put out regular reports covering basic economic facts. These are usually quite general in nature and therefore are of limited value. In some cases results of original research are released. These are of considerable value.

Many business concerns no longer rely entirely on outside sources for economic information. They now have their own departments doing economic research. These departments vary in size from one or two people to as many as a hundred or more in the larger companies.

Economic research carried on by these business concerns is usually divided into two general types:

1. Original research either in establishing facts, or studying already established facts, which cause changes in the supply or demand for a commodity or in the price of that commodity.
2. Coordination of outlook information and forecasts from all sources into workable plans of action.

This type of research is important. Any outlook information or forecast must be tailored to fit a specific problem within a business. Such action plans must be in a form that can be changed quickly with any change in the basic situation. This means that maximum use can be made of forecasts which are based on studied facts. Only a minimum use can be made of general forecasts or those which are based on general or questionable facts.

Time will permit only a brief listing of some of the tools and methods used by private business in studying facts and arriving at forecasts.

Usually the first step in arriving at a forecast is to list all facts present in the situation which may be important to the final decision. The facts should be established before the forecast is made rather than trying to find facts that will justify a forecast which has already been made.

Past behavior of the data is studied to see if there has been a general seasonal pattern. In a few cases, such as eggs or milk, this general seasonal pattern may be the most important tool used in arriving at the final forecast. In other commodities seasonal patterns are of relatively little importance.

Conditioned seasonal studies—analogy studies—can be used more often than general seasonal patterns. Any period of time within a year may be considered in studying a conditioned seasonal. Factors are studied to determine which ones have been dominant over other factors when in similar combinations in past years.

The conditioning factor usually is an economic condition—for example a short corn crop, a rust scare in wheat, big exports of wheat, etc. However, it may be a technical factor such as wheat selling at an unusually wide premium over deferred deliveries. In this case the technical factor usually measures the net influence of many economic factors.

Correlation studies are used as one step in arriving at forecasts. Such studies will show the usual relationship between two or more series of data. Usually when the current price is very high or very low relative to its average relationship with supply and demand factors, it will adjust to a more normal relationship in a relatively short period of time.

How does industry make use of this outlook information and these forecasts?

Probably the greatest use of this information is in determining

when and where to buy raw materials and other supplies. Every industry wants to be assured of a steady supply of ingredients for processing. They also wish to avoid buying ingredients close to the high point in a market. While it is not expected that ingredients will be purchased at the exact low point in a market, pressure of competition demands that costs be kept on a relatively low basis.

With those commodities which can be hedged in a futures market, the actual price is not the important consideration. Here, the goal is to buy when the cash article is priced low relative to the future in which it will be hedged. This assures that inventories can be carried without any loss due to a reduction in cash premiums. With so-called non-hedgeables—those commodities which have no futures market—the goal is to purchase when the actual price of the commodity is close to its low point.

Economic information is used to determine where hedges can be placed to best advantage. Under certain conditions December wheat at Chicago may be expected to gain on May wheat. Under these conditions any hedge against cash inventories should be placed in the May future. Similarly under certain conditions, Chicago futures tend to gain on Kansas City futures. Here, hedges against cash inventories should be placed in the Kansas City market. Analogy studies show that hedges can be kept on a more favorable basis by careful selection of the market and future in which the hedge will be placed.

Many commodities have no futures markets. In some such cases studies will show that the price of a related commodity which has a futures market moves closely enough with the commodity in question so that it can be used as a hedge.

Outlook information and forecasts are used to determine where and when sales and advertising efforts can be expended to realize the greatest net return. For example, if the economic outlook for hogs is much more favorable than the economic outlook for poultry experience shows that more net dollars of profit can be realized by expending a greater than normal proportion of the sales dollar and sales effort in selling hog feeds than in selling poultry feeds.

Economic studies also show what areas of the country offer the greatest sales opportunities. For example, in recent years the East and West Coasts have been gaining relative to the Middle West in poultry numbers. This indicates greater sales opportunities for poultry feeds in those two areas than in the Middle West.

Many companies are using outlook information as a service to customers. This information can be used by salesmen in helping customers plan their operations. Last spring when the hog-corn ratio was unfavorable, our salesmen used a simple chart showing that in all past periods when such a ratio occurred there had been a quick adjustment to a more favorable ratio. Through this simple chart they were able to encourage some customers to go into the hog business at that time and thus be ready to cash in on the very favorable feeding ratios which exist today. The result is good will and a satisfied customer. The one difficulty in this use of information is to be sure that a situation is not exaggerated in order to gain a sales advantage.

A less frequent but most important use of this information is in determining where and when expansion of plant facilities may be desirable. The longer-time factors effecting the economy of a region should be one of the determining factors in the location of physical facilities.

In conclusion, I think we can say without qualification that industry wants more outlook information and more economic forecasts rather than less. I also believe that business would like to have those who prepare this information keep the following points in mind:

1. Always state the facts on which conclusions are based. If possible, give your weighting of the relative importance of these facts. The person using the forecast can then make his own analysis. It also permits him to recognize any change in the situation on which your forecast was based.

2. Make any statements concerning estimated future changes as specific as your analysis of the facts will warrant. A general or hedged forecast is difficult to use.

3. State clearly whether any conclusion is of a long-time nature or of a short-time nature. Many people who disseminate information and forecasts overlook this point. As a result, some readers assume that a forecast means immediately, while others assume that it means sometime in the more distant future.

If a forecast is worth releasing, it is worth putting into a form which people can understand and use.

ROUNDTABLE ON OBJECTIVE EVALUATION OF SOIL CONSERVATION

Chairman: Lynn S. Robertson, Purdue University

WHAT JOHN SMITH NEEDS TO KNOW ABOUT THE BENEFITS AND COSTS OF SOIL CONSERVATION*

H. B. JAMES

North Carolina State College

I ASSUME that it is my task to formulate questions which John Smith is likely to ask, and furthermore, questions which he needs to ask about the benefits and costs of soil conservation. I further assume that I am not supposed to answer the questions but merely to raise them. I have tried to keep my discussion within these limits.

One of the first things John Smith needs to know is the meaning of soil conservation. No doubt he has a general idea as to what it means, but are his ideas exact enough to afford a satisfactory working definition? For example, does John Smith think of soil conservation as simply a matter of preventing visible erosion, i.e., keeping the gullies from getting so deep and wide that they cannot be crossed with a mule, or does he consider and distinguish between fertility depletion and soil deterioration as does Schickele, Bunce, and other writers on the subject? Is he clear on the meaning of exploitation, conservation, and improvement? Does he realize that each of these can be either economic or uneconomic from the social and/or the individual standpoint.¹

What, When, and How Are the Benefits Derived?

A second concept which John Smith will want clarified when approached about conserving his soil is. "What will I get out of it?" Not only will he want to know what the benefits are, but when they will be realized. Will he get the benefits immediately, i.e., within a few years; or will all of the benefits accrue to the next generation? Perhaps equally important is, how are the benefits derived? Must he completely reorganize his farm, change type of farming, and wait

* A paper given at the Annual Meeting of the American Farm Economic Association, Green Lake, Wisconsin, September 15, 1948.

¹ Arthur C. Bunce, *Economics of Soil Conservation*, Ames, Iowa, 1945.

several years for the new plan to become established before he can receive any benefits; or will it involve practices from which some response may be expected the first year as, for example, better fertilization and contour tillage? An example of the other extreme would be reforestation where the benefits would accrue slowly over, say thirty to fifty years.

In order to know what the benefits are, John Smith must have a method of measuring the results of soil conservation practices. although he might be willing to buy one "pig in a bag," it is not likely that he would be willing to buy all of his hogs this way. Just to be co-operative he may be willing to try a few conservation practices without knowing what the results will be, but he will not continue to adopt such practices unless he has some way of evaluating their effect on his farm business. Nor is it enough to be able to evaluate a few soil conservation practices. John Smith must be made familiar with alternative opportunities for maximizing the returns from his business.

Although John Smith's actions will be guided mainly by the benefits which accrue to him and not by those accruing to society as a whole (these may overlap considerably), he should know what the social benefits are. As a citizen he should know about the conservation of resources so as to maximize the benefits to society through time. Also, he should understand the ill effects of dust storms, floods, siltation of reservoirs, and the destruction of scenic and recreational values by the exploitation of the soil.

What Are the Costs and Who Pays the Bill?

The second question John Smith is likely to ask is: What are the costs of conservation and who pays the bill? Or perhaps, he may simply ask "What will it cost me?" Anyway, John Smith needs to know what the cost of adopting soil conservation practices are likely to be. Not only does he need to know the cost of conservation, but he needs information which will enable him to select those practices which are most economical for his particular farm.

In addition to the cost of conservation, the farmer needs to know the cost (or loss) without the use of conservation practices. This also applies to social costs (or losses), some of which are identical with those of the farmer and others which do not concern him directly.

The nature of the cost items and who pays the cost are important

to the farmer. Are costs made up primarily of capital expenditures, or would most of the items be classified as variable costs? Who is to pay the costs, and when are they to be paid? Are the costs to be divided between the farmer and the government? If so, how will costs be divided as to total amount and between capital and variable items? The answers to these questions will no doubt exert considerable influence upon the effectiveness with which any soil conservation program can be operated.

If conservation is not economic to John Smith, then someone else must help pay the bill if the job is to be done. Even where it is economic to the individual, some assistance may be needed because of ignorance, resistance to change and the lack of capital. The stability, or length of time assistance is to be provided, is important. If conservation is economic to the individual, it may be adequate simply to help the farmer make the changes in his farming system which are necessary to soil conservation, assuming that the farmer will not need assistance once the inertia of change has been overcome. On the other hand, if conservation is uneconomic to the individual, it will be necessary to continue to provide assistance. At any rate, the farmer will need to know the type and permanency of assistance available.

What Is the Relation of Benefits to Costs?

The magnitude of benefits and costs are important to John Smith because of his limited resources and the risk involved, but the relationship of one to the other is of primary concern. John Smith needs to know when soil conservation is economic to him and when to society. To determine this, not only should he know the effects of practices on net income, but he should know the effect on net returns which include changes in capital. He should know price-cost relationships and physical responses for soil conservation practices so as to know when exploitation, conservation, and improvement are economic or uneconomic. Obviously, if conservation is economic to him, then exploitation and/or improvement must be uneconomic.² Many farmers are aware of the advantages of depleting their soils through one period of time and improving them

² Arthur C. Bunce, op. cit., p. 10. "Conservation (capital maintenance) is essentially an equilibrium concept and is economic for the individual when further investment or disinvestment is uneconomic. At this point marginal returns from investment equal marginal costs, and marginal returns from disinvestment equal the value of the resource used up."

through another, but they need more information about physical inputs and outputs and price-cost relationships in order to determine the economy of such practices.³

Farmers need to be able to distinguish between fertility depletion which can be replaced without any permanent damage to the productive capacity of the soil and soil deterioration which does permanently impair the productive capacity of the soil and thus reduce its capital value.

What is Being Done to Promote Stability of Price-Cost Relationships?

Some forecast or assumption of price-cost relationships are essential to John Smith's determination of soil conservation practices to be followed. John Smith wants to know whether a production and price program has been developed to stabilize income or at least to mitigate the effects of highly variable prices. If price-cost relationships are subject to wide variations, the risk involved in agricultural production is increased; and John Smith may be even less willing to practice soil conservation without outside assistance.

Summary

What John Smith needs to know about the benefits and costs of soil conservation can be summarized as follows.

First, he needs to know the meaning of soil conservation from the individual as well as the social standpoint.

Second, he needs to know what, when, and how the benefits are derived, and to whom they accrue. What changes will have to be made in his farming system, and how can he measure the results of soil conservation practices?

Third, he not only needs to know the cost of soil conservation, but he needs to know the kind, amount, and permanency of the assistance available.

Fourth, he wants to know the relation of benefits to costs for the individual and for society. When is conservation economic to the individual and when to society?

Fifth, John Smith needs to know what is being done to promote stability of price-cost relationships. Is there a sound program in effect which will mitigate the wide fluctuations in farm income?

³ A larger total monetary income and greater net returns may be obtained over a period of years if crop production for market is emphasized during a period of high prices and crop production for soil conservation during a period of low prices, provided the soil is not allowed to deteriorate.

METHODS OF EVALUATING SOIL CONSERVATION MEASURES*

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FARMERS in the final analysis are the ones who will put conservation on the land. It is important that farmers have adequate knowledge of conservation and how it affects their farms and their incomes. Most farmers are in the business to make a living and are interested in the costs and benefits of conservation.

Research studies in the economics of soil conservation conducted under a cooperative research project between the Agricultural Economics Department, University of Illinois Agricultural Experiment Station, and Research Division, Soil Conservation Service, U. S. Department of Agriculture, were set up with the idea of providing practical answers to help guide farmers and those working with farmers.

Two general approaches have been used. (1) studies of the effects of specific conservation practices, and (2) studies of the over-all effects of conservation farming on the farm business as a whole.

Studies of Specific Conservation Practices

To measure the effects of contouring, contour strip cropping, and terracing, yield comparisons were made of crops grown on the contour, in contour strips, or on terraced fields on the contour, with the same crops grown on the same farms up and down hill or in the usual field pattern (Table 1). This comparison of crops

TABLE 1. YIELD INCREASES FOR CROPS GROWN ON THE CONTOUR COMPARED TO FARMING UP AND DOWN THE SLOPE ON THE SAME ILLINOIS FARMS, SEVEN-YEAR AVERAGE, 1939-1945

Crop	Increases from contouring	
	Bushels per acre	Percent
Corn	6.9	12
Soybeans	2.7	13
Oats	6.9	16
Wheat	3.4	17

* A paper given at the Annual Meeting of the American Farm Economic Association, Green Lake, Wisconsin, September 15, 1948.

grown on the contour and not on the contour on the same farms eliminated, for the most part, differences in management and in practices.

No significant difference was found in total farm operating expense for labor, power, and machinery on farms operating on the contour and not on the contour (Table 2). Farms on which all or a major portion of the farming operations were on the contour were matched with farms of similar physical resources and following a similar pattern of farming but on which few if any field operations were on the contour.

TABLE 2. MAN LABOR COSTS AND POWER AND MACHINERY COSTS PER CROP ACRE ON 135 CONTOUR-TILLED FARMS COMPARED WITH 135 FARMS NOT CONTOUR-TILLED, FOUR-YEAR AVERAGE, 1940-1943

Item	Contour-tilled	Not contour-tilled
Man labor costs	\$11.20	\$12.04
Power and machinery costs	7 46	7.82

Studies of Effects of a Complete Conservation Farm Plan

Before adopting any new practice or program farmers are anxious to know "What will it cost?" and "What are the benefits?" Studies have been made of the effect of soil and water conservation programs on crop and livestock production and on farm incomes in selected areas of Illinois. Data were secured from farm survey records and from the Illinois farm account records. Two general approaches have been used: (1) comparisons of matched high- and low-conservation farms, and (2) before-and-after-conservation comparisons on the same farms

In the comparison of matched high- and low-conservation farms, sample farms of similar land-use capabilities and size but with differences in the amount of soil and water conservation practices were studied. The general procedure followed was: (1) Farms were selected with conservation plans at least three years old on which a high percentage of the plan had been applied. These farms were then classified according to land-use capabilities and size of farm. (2) Neighboring farms were classified according to land-use capabilities and size of farm. (3) A sample of farms without conservation plans comparable in physical characteristics (land-use capabilities

and size) was matched with the previously-selected sample of farms with conservation plans.

These studies of matched farms have been carried out in six areas of Illinois. Ten years of records have been secured for the farms studied in McLean County, Illinois. A summary of the data shows that the benefits of a conservation program have been increasing relatively over the ten-year period (Table 3).

TABLE 3. CROP YIELDS AND NET FARM INCOME, IDENTICAL FARMS WITH HIGH AND LOW CONSERVATION, MCLEAN COUNTY, 1936-1945

	Twenty high- conservation farms ^a	Twenty low- conservation farms
<i>Crop yield index^b</i>		
1936	97	103
5-year average, 1936-40	101	98
5-year average, 1941-45	104	96
10-year average, 1936-45	103	97
1945	106	94
<i>Net income per acre^c</i>		
1936	\$ 5 78	\$ 6 54
5-year average, 1936-40	9 96	7 60
5-year average, 1941-45	23 94	19 77
10-year average, 1936-45	17 54	14 08
1945	27 51	22 64

^a Conservation plans started from 1934 to 1937. In 1945 these farms had a conservation score of 83 compared to 59 for the low-conservation farms.

^b Average yields of all crops for 40 farms equals 100.

^c Returns for capital and management.

In 1946 a study was made of the "Economics of Soil and Water Conservation: Effect of Practices Followed on Farms in Selected Illinois Areas." Soil conservation scores were computed for each farm based on the degree of application of conservation practices to the needs of the individual farm. Each farm had the possibility of scoring 100 if all of its conservation needs had been met. After scoring, the farms were paired into high-score and low-score conservation farms for purposes of comparison. A management score for management other than conservation was computed for each of the farms based on a subjective evaluation of the individual farmer by the farm adviser (county agent), the AAA committeeman, the local conservationist, and the author. Conservation is, of course, an integral part of good farm management and for each group in each area studied high conservation was rather closely associated with

high managerial ability. The high-conservation farms spend more money for soil and related improvements—and the effect of these added capital improvements may have overshadowed the effects of so-called managerial ability.

In another study on the costs and capital requirements of a conservation program data were secured from two sources. (1) A survey was made of farmers' opinions as to the conservation needs on their individual farms. (2) The conservation farm plans as worked out by the farmers in cooperation with the farm adviser (county agent) and the conservation technician were analyzed to determine the conservation needs for the individual farms. Dollars and cents data were applied to both sets of data. In the slowly-permeable problem soils area of northeastern Illinois at the 1948 prices of establishing a conservation program, out-of-pocket cash costs would have averaged \$12.80 per acre based on the farmers' opinion survey of conservation needs, and \$22 66 per acre based on the needs as expressed in the actual conservation farm plans. The capital requirements for needed buildings, fencing, livestock, and machinery approximated an additional \$12 per acre.

Studies based on "before and after conservation" have been largely limited in Illinois to case studies of individual farms. This type of analysis has the advantage of showing the influence of changes in the farming program where management and inherent land resources remain the same.

Problems in Connection with Evaluation of Conservation Measures

A few of the obvious problems are:

1. *Securing comparability of farms.* It is easier to match farms according to their physical land resources than according to capital resources, and it is even more difficult to match them on comparability of management.

2. *Securing continuity of sample.* It is difficult to secure data from the same operator on the same farm over a period of years and to find farmers who do not adopt conservation so as to have comparisons between farmers that use conservation practices and those who do not.

3. *The year-to-year changes necessary* in getting from a non- or low-conservation farm to a conservation or high-conservation farm merit much additional study.

4. *The economic utilization of forage crops* recommended in the conservation plan needs much additional study. Much of the gains from conservation is due to the larger amount of livestock kept and the higher returns from livestock on the high-conservation farms.

Summary

Our economic studies of conservation have helped to lay groundwork for further studies. We feel they have pointed out the following significant facts.

Contour farming increases crop yields, reduces soil and water losses, and on the average does not increase total farm operating costs. Conservation plans do not necessarily increase earnings immediately because usually considerable effort and money must be expended before positive results are achieved. Our evidence indicates that long-time benefits of conservation, however, are certain. Farms having conservation plans when compared with neighboring farms of similar physical resources show that conservation farms have spent more money for soil and related improvements; have more land in legumes and grasses; higher crop yields; produce more and better quality hay and pasture; feed more livestock; have higher livestock production; and secure larger net farm incomes.

An interesting question is raised by the fact that in all comparisons high-conservation farms have had higher livestock efficiency as measured by "returns per \$100 of feed fed." It can be argued, although our studies have not proved it, that it is the better feed supplies—grain, hay, and pasture—on conservation farms that explain the greater livestock efficiency. Conservation farming where needed represents progress. It is important to get farmers to adopt systems which in the hands of ordinary men—and that is what most farmers are—achieve general progress. Systems which conserve soil and water make better crop yields, make land easier to work, and apparently (although this is a tentative conclusion) provide better feed supplies, one of the bases for more efficient livestock production.

INTERREGIONAL ECONOMIC AND SOCIAL ASPECTS OF AN OBJECTIVE EVALUATION OF SOIL CONSERVATION*

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OUR soil conservation programs encourage the substitution of legumes and grasses for part of the intertilled crops and of wheat and other small grains in most of the important farming areas. Improvement of the yield and quality of the sod crops is encouraged in all regions to provide better protective cover for the soil and to increase the competitive position of grassland farming.

Widespread adoption and expanded use of these soil-conserving practices would bring about major adjustments in regional systems of farming. It would mean, for example, a reduction of cotton in the South; of corn and small grain in the Corn Belt, and of wheat in the wheat regions. The counterpart of these adjustments—larger acreages and better yields of grasses and legumes—would encourage changing the regional and interregional patterns of our livestock production.

As pasture and hay are fed largely to cattle and sheep, we could expect greater production of dairy products, beef and veal, and lamb and mutton. Whether the smaller acreages of the feed grains would result in some reduction in the production of hog and poultry products would depend upon the effectiveness of the longer rotations and other conservation practices in increasing the acre yields of corn and other feed grains. When they have been used long enough for their benefits to yields to become fully effective, it now seems likely that the total production of feed units from all sources would be increased on many farms. That has been the experience of most Midwest farmers who have changed over to soil conservation systems of farming.

The major agricultural regions would not share alike, however, in the prospective increases in forage-consuming livestock. That would be true even though the additional beef cattle, sheep and dairy products were obtained mostly from the additional forage produced. Forage resources in the range beef cattle and sheep areas

* A paper given at the Annual Meeting of the American Farm Economic Association, Green Lake, Wisconsin, September 15, 1948.

and in the northeastern dairy region are limited in their flexibility. They can be increased only by better management practices that increase yields, whereas both the acreage and the yield per acre probably would be increased in the Corn Belt and in the South. Furthermore, it now seems likely that farmers in surplus grain-producing areas would use additional grain for supplementing the larger output of forage crops which they would feed to dairy cattle, even though the ratio of concentrates to forage in the average ration probably would be somewhat wider than now.

The need for more grain for supplementing additional forage, along with the possibility of some reduction in the production of feed grains due to fewer acres, might tend to curtail the usual shipments of feed grains from the Corn Belt to feed-deficit areas. At least, farmers who are planning soil conservation programs, regardless of where they are located, should move cautiously in planning adjustments which would involve buying considerable additional grain to supplement the additional forage crops produced. Producers of grain probably will have less to sell from an average crop, except at a premium price.

The beef cattle herds on Corn Belt or Cotton Belt farms where the production of forage crops is increased probably would be carried largely on pasture and roughage. If cattle fattening enterprises are continued or set up on Corn Belt farms, the feeding period probably will be lengthened so as to use more pasture and less grain. Thus, the marketing of cattle for slaughter would tend to be concentrated more in the fall months and a larger proportion of them would be of the lower grades. That probably would modify the beef cattle price structure in the direction of greater seasonal variation and a wider spread between grades.

In some areas the need for shifting from soil erosive crops to grassland farming is so extensive that establishment of profitable farming units, which would be based almost entirely on grass, would mean consolidation of farms and fewer farmers. That in turn implies a new tax base and the curtailment of such services as those provided by roads, schools, and villages. On the other hand, where farming becomes more intensive, it may be necessary to set up new marketing facilities, such as creameries and local livestock markets.

These and many other prospective changes in the pattern of production and time of marketing have an important bearing on an objective evaluation of soil conservation, because they will influence

future price and cost relationships. It is unrealistic to separate future conservation benefits from the effects of prospective prices and costs in determining what would be desirable adjustments in farming in an area.

If the production of dairy products, for example, increases in areas outside the present dairy regions because of changes in the feed pattern, such increases will appear as new competition to those regions. And the lower prices for dairy products that would result in the absence of a sufficiently compensating increase in demand would be detrimental to the dairy farmers who have built up their farm plants on the basis of the situation prevailing before, unless they can increase production efficiency enough to offset the advantages created for dairying by the changes in the feed pattern in the other areas. Yet, even though greater efficiency may not be practicable in the older areas, the increase in production of dairy products may still be desirable from the national viewpoint. Perhaps our national production pattern should be shifted toward a larger production of dairy products to provide a better diet. And such a shift might mean a larger per capita income for all farmers as a group.

The new price relationships that would be brought about by the changes in the production pattern may also prove to be disappointing to the farmers who shift into dairying or beef cattle production, if the evaluation of soil conservation systems of farming is based on present instead of prospective costs and prices.

In making an economic evaluation of soil conservation systems of farming for a farm or a local area, we, as research and extension workers, generally have made the assumption that changes in the production pattern would not affect prices for the products produced. Also we frequently have disregarded the impacts on other farms and other areas. We cannot, of course, do otherwise satisfactorily until the interrelationships of prospective production patterns, demand, and prices are analyzed in closely coordinated research relating to all important farming situations.

The task of making the kind of analysis that is needed is exceedingly complex. It is probably beyond the scope of research in a single agency. Two closely related types of analysis would be involved. The first of these consists of an analytical study of the prospective supply and demand conditions and the probable equilibrium prices at various future dates, taking into account adjustments in land

use from the standpoint of soil conservation as a major influencing factor. The second type of analysis would be a study of the divergences between private and social marginal net products when the new systems of farming in one region impair the economic opportunities in another region. These over-all studies may have to be carried out with rough-and-ready data, particularly on the supply side. But our economic evaluations of soil conservation of an individual farm and in a local area will be much more fruitful if they are made within a more adequate framework of the prospective economic conditions. The changes in prices that are generated by the soil improvement practices on a multitude of farms also become a part of the forces influencing changes in the production pattern on those farms.

COOPERATING IN OBJECTIVE SOIL CONSERVATION RESEARCH*

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SOIL conservation is one of the more basic and long-run agricultural problems which faces the individual farmer and society. Both are concerned with (1) the level of conservation which is economic and (2) the economic means of attaining any given level of conservation. Although far from being fully developed and even though the two are complementary, the theory of conservation economics has progressed beyond empirical research. Principles have been developed which have universal application given the environment set forth in the basic assumptions. But in relatively few instances, indeed, can we point our finger to specific practices, farming areas, soil associations or resource ownership situations and indicate where conservation is or is not profitable to society or the individual. Even the amount of research relating to returns of individual farms has been extremely meager. Yet knowledge of returns to the individual is basic to any sound conservation policy or program. Extreme testimonials suggest that conservation either is or is not profitable to the farmer. Yet there is a dearth of objective research which might establish the facts. Why is this so?

One of the more important obstacles to empirical research in conservation economics has been the complex environment within which it must take place. The returns from conservation are easily confounded with returns from other techniques and resource combinations where attempt at measurement is made by means of such conventional approaches as management return, labor income or interest on investment. On the other hand study of major changes as rotations and land use make little sense unless considered as part of the farm as a unit and as related to livestock systems, labor requirements, capital investment, and the economic environment in general.

Measurement of soil conservation returns by means of records and surveys is extremely hazardous unless the sample is properly stratified by soil type, scale of operations and other farming tech-

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niques or characteristics. Accurate estimates are perhaps possible only if the population studied is restricted to a group of farms homogeneous in all respects except attainment of conservation practices and related resource combination. The sample design must be as rigid as the controls of the physical experiment. Even then, the findings apply to a static price situation and a sample at one point in time. Ordinarily the study must be made for one year or a period of several years. Yet the results apply only to the price period used and may differ greatly from the economic world in which prices vary continuously from one level to another. Even were prices static in the sense that they remain at the same level or in the same relationship over time, data from a past period will not always provide correct income estimates for the future. Physical research indicates a widening gap in yields for two soils on which widely different degrees of erosion control or fertility maintenance is attained. Finally, the range of observations is necessarily restricted to the fairly narrow limits in terms of rotations, forage-grain rations and other practices which farmers have put into effect.

Estimation of returns by farm records can be made through appropriate stratification and sample design. However, it appears that a more promising alternative rests in cooperative research between the farm management worker and physical scientists in the fields concerned. Given the basis physical data, budget analysis can then provide income expectations under various price and resource ownership situations. Were it readily available a complete inventory of production functions, transformation rates or input-output ratios which relate to conservation could be put to use in designing conservation farming systems which are economic. Needed especially are data indicating the marginal rate of substitution of forage and grain as product outputs from the land and as feed inputs in livestock production. We need to know the extent to which forage complements grain in the sense that total production (and not yield per acre) of the latter increases as acreage of the former increases and the rate at which the two substitute for each other once forage is expanded so far as to become competitive with grain or other crops. This information should be available under various mechanical practices and for different time periods. Similarly, data indicating the marginal rate of substitution between grain and forage and the consequent effect on the production period is needed for the numerous types and grades of livestock. By com-

binning these data with other price and resource input data, estimates of optimum conservation farming systems would be facilitated. However, information is needed not for two practices, rotations or feeding systems alone, but for all or a number of points over a wide range of the production surface or curve. In the past physical data has not often been available in this form.

Without this cooperative effort, future progress is likely to be slow. The production economist who must resort to farm surveys and records alone is limited by the progress of farmers in adoption of new practices. He can do little to design farming systems which extend beyond the limits which farmers have already gone and is handicapped by the expense and time necessary for proper stratification of his sample. Yet the results of physical research will not suggest the optimum farming system or combination of resources where they fail to recognize the basic production and economic models involved. Too, economic interpretation of a small sector of data by the physical scientist may often lead to erroneous conclusions where it does not relate to the farm as a unit. The worker in farm management or production economics might well initiate effort toward more cooperative research. Unlike most other specialists he is concerned not only with land, capital or labor considered individually but also with the economics of land, livestock, rotations and all resources and production problems as they relate to each other.

Research workers at the Iowa Agricultural Experiment Station have made some important initial progress in cooperative research which should eventually aid in solution of conservation farming systems. The Departments of Agronomy, Animal Husbandry and Economics are cooperating on projects at the Clarinda and Monona experimental farms to determine the rate and economy of forage-grain substitution in beef production. In time this information will be integrated with the results from various rotations and mechanical practices on the two soil types along with supplemental information to aid in suggesting optimum conservation farming systems. These experiments will not complete the inventory of production functions necessary. Still required is knowledge of the marginal rate of substitution of grain and forage for other types and grades of livestock. Fortunately since we have some agronomists and animal husbandrymen who understand and appreciate the economic

models involved, there is possibility of extending this cooperative effort in time.

However, the task is great and is one which might be attacked cooperatively on a wider basis. Production economists, agronomists, engineers and animal husbandrymen might well get together from a number of states, outline the complete range of data needed, and then proceed with a division of labor which would make a larger amount of data available in a shorter time period. Some states might specialize in establishing the marginal rate of grain-forage substitution for several grades of dairy cattle while others investigate the practical range of substitution for feeder cattle, hogs or other livestock. The findings in one state would have general applicability in others. A similar division of effort is also possible in the case of crops where one soil type is common in two or more states. Properly stratified surveys and farm records might be used to supplement experimental data in the case of labor or inputs which do not lend themselves to measurement by means of other research techniques.

First, it might be asked, what right has the economist to think in terms of technological ratios? The answer is obvious. All economics of production or consumption deals with technological or psychological ratios. In Economics as a science dealing with the allocation of scarce means between competing ends, monetary value is simply a common denominator for measuring these physical relationships. Regardless of how defined, economics ultimately deals with equating technological or psychological ratios in one form or the other for attainment of a maximum quantity. Only under these conditions are profits to the business firm, utility to the household or welfare to society maximized. There is nothing improper about the economist's being concerned with these ratios.

Second, it can be asked, is the technical scientist interested in cooperative research? The answer is probably yes and certainly so if the economist initiates some effort in this direction. Historically, there has perhaps been more cooperative research between production economists and technologists as groups than within the field of technology generally. Even then it has been far too little. I leave for you the question of how we get a program of the proper magnitude initiated.

ROUNDTABLE ON FARM TAXATION

Chairman: Norman J. Wall, Bureau of Agricultural Economics

ANALYZING THE TAX LOAD OF AGRICULTURE*

TYLER F. HAYGOOD

Bureau of Agricultural Economics

FROM time to time the Bureau of Agricultural Economics is asked to supply figures that will give a picture of the "tax load" of agriculture in the United States. These requests, which take various forms, come from many different people—editors of farm publications, makers of public policy, students of agricultural economics, and research workers in farm organizations, to mention a few. It is obvious from these inquiries that there is a serious lack of agreement as to what is meant by the tax load. It is hoped that this paper will contribute in a small way to a better understanding of the problems involved in such a concept, even though no happy solution is offered.

An economic analysis of the tax load of agriculture should begin with a definition of agriculture that is appropriate for such an analysis. Is it an industry composed of all farms, or is it a group of people earning a living from farm operations? The distinction between farmers as a group of taxpayers, and agriculture as a sector of the national economy making its contribution to the support of Government, is fundamental.

To be more specific, by Census definition a farm is land used in agricultural operations provided the tract is 3 acres or more in size and its agricultural products in a given year are valued at \$250 or more. Thus farm real estate taxes as estimated by the Bureau of Agricultural Economics—which uses the Census definition—are so much per acre of "land in farms." But for statistical computations the exact number of acres must be determined, and so the Census elaborates as follows:

Land in farms includes considerable areas of land not actually under cultivation and some land not even used for pasture or grazing, but all such land must have been under the control of the operator and considered a part of his farm in order to be counted. However, large areas of timberland or other nonagricultural land held by an operator of a farm as a

* A paper presented at the Annual Meeting of the American Farm Economic Association, Green Lake Wisconsin, September 15, 1948.

separate business, and not used for pasture or grazing, or for any other farm purposes, were excluded. Land neither owned nor leased, but from which crops, including wild hay, were harvested, was reported as part of the farm. When cattle, sheep, or other livestock were grazed, or pastured on land neither owned nor leased by the operator, such land was not included as part of the farm.

Obviously there are grounds for disagreement with the types of land included in the Census definition and so we find some of the States arriving at rates of taxes per acre on land within their borders that differ from BAE figures. Specific measures of the tax load when stated on a per acre basis, therefore, would be affected by the definition used in the computations.

The view of agriculture as a composite of farms is significant, particularly in property taxation, but agriculture as an aggregate of farmers also is important—especially in income taxation. Both concepts require precise definition, but the second raises the immediate question of just who is a farmer and what is included in farm income?

The Census does not define a farmer directly. A "single-unit farm operator" is the person who operates a farm independently. "He directs the operations on the land worked by himself, his family, or hired laborers." There are several classes of operators, such as full owners, part owners, managers, tenants, etc. For Census purposes, the "rural-nonfarm population" is that part of the people who live in communities with concentrations not greater than 2,500 persons.

But determination of the tax load of agriculture viewed as an aggregate of farmers depends upon how still other questions are answered. What is to be done about elderly farm people who have no farm income and who do not work; urban employees who commute to their homes on farms; and professional and other people who obtain their main income from urban employment but who own and even operate their farms? There is also the problem of determining whether urban or governmental investments of farmers should be regarded as sources of farm income.

Tax-rate Concepts

The problems listed above illustrate the problems one faces immediately when contemplating the tax load of agriculture. Now we turn to the various uses of the term itself. Sometimes the tax load of agriculture is spoken of as the absolute amount of taxes

paid by farmers. When so used, some base is selected. If the basis is the assessed value of property, ordinarily the tax load is equivalent to the tax rate. Thus the United States farm real estate tax rate for 1947 was 53 cents per acre or 96 cents per 100 dollars of valuation. Taxes per capita (the poll tax, for example) also may serve to measure the tax burden in the sense of tax rate.

But property tax rates may be poor measures of the relative tax load within States in which the ratio of assessed to true value varies greatly between counties or other local jurisdictions. The same thing would be true in a comparison between States. When the measure used is the ratio of taxes to true or market value of property or wealth, inequalities of assessment are corrected. But as a practical matter, reliable data often are not available. This is particularly true when the tax levy applies to intangible personal property.

When the tax load is thought of as the tax per acre of land in farms, no account is taken of different degrees of improvement of land or of its productivity. Taxes per square mile of total area are significant as measures of taxation when they are related to land utilization. Here, sparsely settled areas are likely to have a low tax rate per square mile but a high tax rate per dollar of value.

An approach commonly employed is to relate taxes to income. Often in such cases, confusion arises because no distinction is made between the income of agriculture and personal incomes of farmers. But this approach is different from the establishment of a ratio of taxes to wealth or property, and it is particularly significant when most of the people are salaried or when incomes are characterized by a high proportion of recurring receipts. If the tax load of agriculture alone is studied, this measure is unimportant unless it is later related to the tax loads of people in other industries—which, because of their many dissimilarities, is not an easy task. But when so used, it is often difficult to obtain accurate data pertaining to personal agricultural incomes. Cash rents, for instance, apply to income from real estate only and the earned income of farmers as entrepreneurs is absent.

Quantitative Concepts

There are those who regard tax-rate concepts of the tax load as superficial and incomplete, particularly when they are considered a measure of burden. They prefer quantitative measurements such as aggregate Federal, State, and local tax payments made by all

farmers in a given period of time, usually a year. In this concept, not only wealth and income, but also farm expenditures play an important part in the technique of measurement, for they are bases for determining, respectively, State and local property, Federal and State income, and Federal and State excise and general sales taxes—to mention a few examples.

In its simplest form, a listing of taxes paid, together with their amounts, would constitute the total tax load according to such a concept. An illustration that might be given, although it was not so-called when published, is an estimate of farm tax payments made in 1930 by Donald Jackson of the Bureau of Agricultural Economics. It is as follows (in millions of dollars).

Real estate	566
Personal property	100
Gasoline	99
Automobile licenses	61
Inheritance	10
Income	8
Poll	6
Total	850

A vast array of new taxes has been added to this list since 1930, and rates for some of the older sources of revenue have been increased so that their earlier positions in the array have changed considerably. One of the "new" levies is the general sales tax which was introduced in the early thirties, and which is now collected in

TABLE 1. STATE TAX COLLECTIONS BY TYPES, FISCAL YEARS 1947 AND 1932

Tax	1947		1932	
	Amount	Percentage of total	Amount	Percentage
	<i>1,000 dollars</i>	<i>Percent</i>	<i>1,000 dollars</i>	<i>Percent</i>
General sales	1,178,849	20.3	7,070	0.4
Gasoline	1,124,397	19.4	534,160	28.3
Net income	878,550	15.2	145,450	7.7
Motor vehicle	540,348	9.3	310,055	16.4
Alcoholic beverage	481,573	8.3	1,368	.1
Property	261,995	4.5	323,477	17.2
Tobacco product	244,767	4.2	15,166	.8
Death and gift	166,352	2.9	149,416	7.9
Other	920,783	15.9	400,366	21.2
Total	5,797,614	100.0	1,886,528	100.0

Adapted from *State Tax Collections in 1947*, and *Financing Federal, State and Local Governments. 1941*, Bureau of the Census. Unemployment compensation taxes excluded.

27 States. Detailed annual estimates of these taxes that are paid by farmers are not available, but their relative importance in State fiscal systems is shown in Table 1 for 1947 as compared with 1932—years for which data are readily available.

It will be noted that general sales taxes were near the bottom of the list in 1932 but that by 1947 they had reached the top as a revenue producer for the 48 States—despite the fact that only about half the States imposed them in the latter year. Also, three States—West Virginia, Michigan, and Washington—obtained over half their revenue from this single source in 1947. As for farmer-payments, it has been said that "Farmers may have paid as much as \$50,000,000 annually in State general retail sales taxes in the last few years."¹ In addition, farmers have paid a share of a related group of selective sales taxes to Federal and State governments, and very recently some general sales levies to local governments in some of the States (California and Pennsylvania, for example)

Of the older sources of revenue which have higher rates, perhaps from the farmer's viewpoint the Federal income tax is the most phenomenal. The 8 million dollars paid by farmers in income taxes in 1930 included payments made to the Federal Government and to all the States that imposed the levy at that time. Beginning in 1941 when only 15 million dollars were paid to the Federal Government, these payments rose rapidly to reach a peak of 960 million dollars in 1948 (Table 2).

TABLE 2. FEDERAL INCOME TAX PAYMENTS BY FARMERS, 1941-48

Year	Million dollars	Year	Million dollars
1941	15	1945	725
1942	50	1946	720
1943	425	1947	760
1944	275	1948	960

State income-tax payments made by farmers are relatively much less important than are Federal income taxes. Only 31 States use the tax, and exemptions are high and rates low in comparison with Federal law. It has been estimated that farmers' payments "probably did not exceed \$40,000,000 even during the high-income war years."² Thus Federal and State income taxes paid by farmers

¹ Gerhard J. Isaac, "Farmers' Taxes," *Agricultural Finance Review*, November 1946, p. 14

² Gerhard J. Isaac, *loc. cit.* p. 13.

probably totaled about one billion dollars in 1948.

Historically, the chief contribution made by agriculture to the support of government was through the property tax. This was due mostly to the nature of the farm enterprise. Land was the principal form of wealth and it was certainly the major source of income to rural America. A large farm indicated that its owner possessed considerable ability to pay taxes. A small one indicated the opposite. Business or personal losses and expenses of farmers played little part in tax calculations. In recent years of big incomes and high tax rates, however, income taxes have superseded in amount, total property levies, although the latter remain the most important single source of revenue for local governments in this country. A large number of the States no longer impose property taxes for State purposes or they levy only a nominal rate.

Over the years, the property tax has become primarily a tax upon real estate (Table 3) and to a more limited extent upon tangible personalty. As agricultural wealth consists largely of such property, it is not surprising that the property tax has continued to be important in the farm tax load. In 1947 farm property levies were \$705,161,000. This compares with the previous all-time high of \$640,000,000 in 1929 and with a depression low of \$420,000,000 in 1934. During the recent war period, farm property taxes fluctuated within narrow limits—quite in contrast with what happened during the World War I period.

TABLE 3 TAXES LEVIED ON FARM PROPERTY FOR SELECTED YEARS

Year	Property taxes levied		
	Total	Farm real estate	Farm personal property
	<i>1,000 dollars</i>	<i>1,000 dollars</i>	<i>1,000 dollars</i>
1929	640,822	567,495	73,329
1930	638,038	566,956	71,082
1935	430,636	393,878	36,758
1940	445,665	401,780	43,885
1945	554,109	471,181	82,928
1946	616,954	524,621	92,333
1947	705,161	600,161	105,000

The tax load of agriculture, even when used as a quantitative measure, does not end there, however. Automotive taxes paid by farmers consist of licenses and permits and motor fuel taxes to Federal and State governments. Amounts paid by farmers in recent

years are presented in Table 4. As might be expected, State gasoline taxes declined in amount during the war years when rationing was in force and then rose again. In 1947 they amounted to more than 106 million dollars. Federal fuel oil taxes continued upward during the war, rising from \$35.8 million in 1940 to 63.3 million in 1947. Unlike most State gasoline-tax laws, the Federal Government levies its tax on all gasoline used on the farm and not just that used by farmers personally. Licenses and permits cost farmers \$58.7 million in 1940 and \$90.8 million in 1947.

TABLE 4 AUTOMOTIVE TAXES PAID BY FARMERS, 1940-47

Year	Licenses and permits	Motor fuel taxes	
		State	Federal
	<i>1,000 dollars</i>	<i>1,000 dollars</i>	<i>1,000 dollars</i>
1940	58,723	79,265	35,850
1941	62,906	81,761	45,382
1942	97,599	76,661	46,034
1943	86,893	72,843	46,556
1944	86,680	74,545	49,080
1945	89,324	82,001	52,765
1946	77,604	95,135	58,209
1947	90,838	106,444	63,329

Many other taxes paid by farmers would have to be estimated if the tax load were looked at as an accumulation of the amounts actually paid into Federal, State, and local government treasuries by farmers. It should be emphasized that the above amounts are only estimates, and that the more important taxes only are included. Further improvements in the statistical processes are constantly made, and for that as well as for reasons which appear below, it seems wise not to set down the various amounts in a single table as representing the tax load of agriculture.

Qualitative Factors in Tax Load

It should be clear from the foregoing discussion that a quantitative measure of "obvious" tax payments by farmers—such as those levied against income, property, or transactions—can go only part of the way in determining the tax load of agriculture. At this point the distinction between agriculture as an industry and farmers as taxpayers again becomes important. A physical sector of the economy does not "bear the burden" of anything, certainly not of taxes. It may have part of the support of government imputed to it. But

the farmer-taxpayer himself, the human being, makes any sacrifices that taxes create. Thus students of public finance are almost unanimous in thinking that, in general, taxes levied according to the ability-to-pay principle are better.

It would appear necessary, therefore, to analyze several additional factors (that may be called qualitative, for want of a better term) if the tax load in the sense of the real burden or justice of taxes is to be determined.

One of these is the degree to which the burden of taxes is shifted to, or away from, farmers. The final word on shifting has not been written but there is general agreement on a number of points. For instance, a farmer who pays an individual net income tax is unable to pass it on, as his prices were determined before the tax was determined. Thus both impact and incidence of the net income tax—that is, the initial burden of the payment as well as the ultimate burden—are at the same point. This is true in the long-run as well as the short-run.

Not so, however, with a general sales tax. Retailers ordinarily are held responsible for the payment of general sales levies, but they raise the prices of their goods to include the tax. In this case the short-run impact is upon the retailer and the incidence is upon the consumer (including farmers, if they buy the taxed articles). But in the long run, the incidence may be upon the producer of the taxed products, either partly or wholly, depending upon circumstances. To illustrate, if food is taxed and prices are raised as a result, the demand for food may decline, the supply sooner or later may be affected adversely, and the ultimate burden of the tax may rest upon the farmer-producer who loses money until he can shift to other lines of production. Of course if a food shortage exists and all that is produced is sold even at higher prices attributable to taxes, this reasoning does not apply with full force. At any rate, the case illustrates that some taxes may be shifted backward as well as forward, and that both producers and consumers may share in the impact or incidence of taxes or in both.

It was said years ago that agricultural economists working in taxation "are inclined to reason that no taxes paid by farmers are shifted. They overlook the fact that there probably is a relationship between the division of ordinary taxes for road support between city and country, and the prices at which farm products in the long run sell in urban markets. They also forget at times the probable

shifting to agriculture of some of the taxes on railroads and industrial property.”³

Agreement is general that taxes on property which reduce net incomes from it are capitalized and that they thus lower its value. The impact and incidence of such levies are therefore on the present owner, although it is not known how long it takes for land values to adjust to rises in real estate levies.

A second qualitative factor in the tax load of agriculture is the indirect effect of certain taxes. There are tariffs, for example. If a tax on imports completely excludes the product, one cannot say that the tax has been shifted because none is collected. Nevertheless domestic consumers feel the effects of such a duty. Certain nonfiscal revenue measures also illustrate the point. These include levies on bank notes of States (which were 100 percent effective), billboards, alcoholic liquors, and tobacco. To the degree that such impositions are effective, they reduce the demand for these products. Thus farmers who produce the raw materials entering the manufactured products such as whiskey or cigarettes would have the demand for grain and tobacco reduced. This is true despite the fact that the tax may be so high that not a great deal of revenue is obtained.⁴

A third qualitative factor in the tax load of agriculture is the indirect effect that public expenditures have on taxes. To illustrate, the ratios of taxes to real property values may be considerably affected by the nature and extent of public expenditures made with tax payments. A drainage-improvement levy may increase productivity of real estate. If the net income from land is \$8 per acre and the property tax is \$2, the ratio of taxes to income is 25 percent. But if an improvement costing \$1 per acre in taxes is made, and the income of the land rises \$1 per acre, the value of the land does not change, although the ratio of taxes to income is raised to $33\frac{1}{3}$ percent. But if the \$1 additional tax increases the land product \$2, the ratio is changed to 30 percent.

In this case, public expenditures have been assumed to be immediately productive. But if government services contribute to improved living as when they take the form of better schools or roads, net cash incomes may not be increased immediately. Few

³ “Research in Public Finance in Relation to Agriculture,” a report of Advisory Committee on Social and Economic Research in Agriculture, *Social Science Research Council*, Bulletin No. 1, 1930, p. 14

⁴ It should be noted that the difference between the incidence and the effect of a tax (as used here) is sometimes very slight, as shown in the illustration of the tax on liquor and tobacco products

would argue, however, that the income of an educated community is not greater in general than that found among illiterates. In many cases incomes are directly raised by public expenditures, and in many more present expenditures will result in long-run social and economic development—such as is found in the Tennessee Valley.

Significance of the Tax Load of Agriculture

It has been pointed out that the tax load of agriculture cannot be designated adequately merely as so much taxes per acre, or per \$100 of property value, or per \$1,000 of gross or net income. Nor is it equivalent to the total amount of taxes paid directly to government by farmers. The tax load in the sense of a burden, moreover, is modified somewhat by the nature of specific and general benefits received by taxpayers from public expenditures

Unfortunately research techniques have not been developed to the extent required for a precise or even approximate measurement of the tax load of agriculture as many now interpret the term. Considerably more inquiry is needed in this field. In recent years farmers' tax payments have grown enormously, but have they increased out of proportion to those of other taxpayer groups? In other words, What are the relative tax burdens of farm and other groups in the national economy? To answer these and related questions, one needs to explore several phases of taxation much more thoroughly than has been done up to now.

One phase of inquiry might center about the proper allocation of functions between the various levels of government. In those States in which roads and schools are provided for largely or entirely by the central government rather than by local jurisdictions, the tax burden may have been shifted in large measure from property owners to others. Local governments still rely heavily upon property levies but most States depend upon income or sales taxes. Thus the burden of taxes levied for farm roads and schools may be shifted to persons who receive nonfarm incomes or it may be diffused to all taxpayers through a general sales tax.

This possibility is of further significance to the farm tax load. When chief reliance for revenue is placed upon income taxes, tax payments of individuals decline as their income drops. In the past, property levies have not followed this course. They tend to be relatively fixed, or when income and other tax sources dry up, it is possible that property taxes may actually increase, despite a business recession.

Another phase of inquiry might seek to determine whether the ever-growing cost of government is equitably distributed among the various economic groups in the community and among individuals within each group. Highway systems have been improved and expanded. Farmers enjoy these as aids to the marketing process, as well as for personal pleasure. But large concentrations of population also depend upon good roads for fresh fruits and vegetables, among other things. Who should pay for the roads, and in what proportion? Today, school programs are more varied and costly. In the past, rural communities have contributed heavily to the labor force used in urban areas. An educated citizenry makes a nation great in human resources. Who should pay for improved educational opportunities, and in what proportion? Then there are Federal and State conservation, price support, social security, and numerous other programs for rural and other people. Everyone benefits from these public expenditures and everyone pays in some measure. But is the tax load equitably distributed?

An important difficulty in analyzing the tax load of agriculture lies in the fact that some taxes are paid by the farmer as a producer and these are properly included in business expense. Others are paid by him as an individual out of his personal income. Some taxes fall partly in each category. But in making an analysis, these and other difficulties with an analysis should not prove insurmountable. Some day somebody may come up with an acceptable single figure, which will be *the* tax load of agriculture.

DISCUSSION*

ROBERT G. CHERRY

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I should like to facilitate discussion by emphasizing three major points concluded from Mr. Haygood's paper. First, an adequate and reliable measure of the tax load of agriculture is needed by makers of public policy, agricultural workers, and other important groups. Second, the scope of work now being done in analyzing agricultural taxes—which consists mainly of the various farm property tax indexes—is not adequate for all present day needs. And, third, the job of measuring the tax load of agriculture is beset with a number of complex problems, involving both principles and techniques, that must be solved before a figure representing the tax load of agriculture will be acceptable.

It is doubtful if any farm tax worker will seriously dispute this summary of the present status of farm tax studies. The greatest contribution of the

* A discussion presented at the Annual Meeting of the American Farm Economic Association, Green Lake, Wisconsin, September 15, 1948.

paper has been in defining the problems and relating their significance. Though admittedly few solutions were offered, the fact that the problems have been delineated and analyzed marks a long stride toward a solution.

There is reference to the BAE and the various state farm property tax indexes. Apparently these data are reasonably satisfactory for the purposes for which they were devised. I do think we are inclined to accept them too much as an absolute measure, per se, instead of an indicator of trend and relative levels.

Texas happens to be one of the states that has arrived at rates of taxes within its border differing from BAE figures. The Texas index is weighted by total land area instead of Census figures for farm acreages. It is my understanding, however, that the method used by Texas was not chosen originally on the basis of any particular disagreement with the types of land included in the Census, but rather with a belief that total land area would result in a more significant figure for Texas use. The point is that we each show different figures for essentially the same measure, a fact that indicates the desirability of uniformity and coordinated efforts.

If an over-all measure of farm tax loads is ever attempted on a national scale, general agreement on questions posed by Mr. Haygood should be reached before the states go their separate way on phases of work that may be done locally, either in cooperation with the Bureau or as independent projects.

On the score of quantitative concepts vs. qualitative factors, there seems to be an advantage of expediency in favor of commencing work on an over-all measure with emphasis on the quantitative. Perhaps gradual perfection of methodology on a quantitative basis will give impetus to work on the qualitative aspects.

Considerable emphasis was given in this paper to the factors complicating the qualitative aspects. I should like to mention one additional factor that currently seems to be very pertinent. It is the relationship of incidence and shifting to the point between perfect competition and pure monopoly at which a given industry or entrepreneur is operating. If it is generally agreed that under monopolistic pricing practices an entrepreneur will bear some portion of taxes out of his profits, which under competitive pricing would ordinarily be passed on to the consumer, then how are we to know what portion of a gasoline tax, for example, is passed on to the farmer and what portion is borne by the producing, refining, or marketing people unless the competitive factor is considered.

It was emphasized that the tax load of agriculture could not be measured as so much taxes per acre, or per \$100 of property value, or per \$1,000 of gross or net income. Further, it was stated that the load was not equivalent to the total amount of taxes paid directly to government, the point being that the burden is modified somewhat by the nature of specific and general benefits received by taxpayers from public expenditures. This unquestionably is true with many types of public services. But for some public expenditures, would it not be confusing two different areas of philosophy to try to modify one against the other. An expenditure for public education is an example.

Public educational services have developed in American government since the first half of the 19th century under a principle that equal oppor-

tunity for a minimum standard of education should be provided for all. That is, public schools are founded and operated under a philosophy and set of principles governing education in a democracy. The revenue to support this service is obtained through the application of principles of taxation, a separate and distinct area of democratic philosophy. The exact relationship between the benefit principle of taxation and principles of education may in some respects be a moot question. So, for practical purposes, it may be necessary to disregard different levels of benefits from services; studies of disparities of benefits would of necessity then be pursued as distinct areas of research.

DISCUSSION*

HAROLD G. HALCROW
Montana State College

One reason, perhaps the main reason, for attempting to analyze the tax load of agriculture is that concepts of tax load are used in formulating tax policy. Tax policy of agriculture becomes a part of general agricultural policy. None of this policy may rest on a firm foundation without an analysis of what the tax load is in terms of its effect on agricultural output and on incomes within agriculture.

The tax load of agriculture has been measured at various times in terms of rates or of aggregates. Such a measurement is largely superficial in an economic sense because no consideration is given to the shifting and incidence of the taxes levied against farmers or farm property or to the effects of other taxes, such as tariffs and public utility taxes, which may be shifted in part to agriculture. The significance of such rates and aggregates more-over depends on the benefits that are received from public expenditures.

Using rates or aggregates in the usual manner, therefore, does not give us a meaningful concept of tax load and provides very little guide to policy. Sharpening our statistical procedure, no matter how necessary in an empirical sense, will not provide us with an answer to the significant problem of policy because the essence of our case will be contained in something quite beyond these figures. It will be found (1) in studies of the effects of various taxes, farm property taxes, income taxes, sales taxes, on resource utilization within agriculture and on incomes received by farmers, (2) in studies of the incidence of taxes levied on corporate income or on non-agricultural property, and (3) in studies of the production and income effects of public expenditures.

The place to start might be in the analysis of the incidence of some tax relatively easy to identify such as the farm property tax. Even here incidence should be considered broadly. To a new purchaser, property taxes may be burdenless because capital values are lowered by the existence of the taxes levied. If aggregate output is as large with such taxes as it would be without them, however, the burden of these taxes may not be shifted out of agriculture and may eventually reduce farmers' incomes over a period of years. The study would have to be rooted in the dynamics of the indus-

* A discussion presented at the Annual Meeting of the American Farm Economic Association, Green Lake, Wisconsin, September 15, 1948.

try because the facts of capital rationing, of yield and price uncertainty, of the general relationships between costs and prices, would help to determine how such taxes react on output. The fact that farm prosperity comes in irregular cycles may be significant. In periods of prosperity, for instance, farmers make some investments which are beyond the long-time income expectations for the resources involved. This leads to an excess of investments in terms of marginal productivity and to a rigidity toward readjustment in low income periods. Under such conditions the incidence of the taxes levied may be on the farmers themselves. If, for reasons of general welfare or for other reasons, this were considered undesirable, tax policy changes might be instituted. If the tax system were changed to exact a larger payment in prosperity and a smaller payment in depression investments might be more in keeping with longer-time income expectations. To effect such a change less reliance might be placed on the property tax and on sales taxes with a greater reliance on income taxes. Corresponding changes might be made in state and local government finance structures. Looking ahead we might see that the income tax should be adapted to fit farm conditions more adequately than is now done. The withholding provision might be tailored to farm use. Farmers could settle their tax accounts with the government at the end of each year and tax liability could be averaged over a period of three or four years. Some farmers might then obtain refunds in low income years. Thus studies of incidence and of tax policy also might help us to solve some of our farm problems which are associated with irregular income.

A second field of survey lies in the realm of industries serving farmers. Railroad property taxes may be used as an illustration. Most farmers probably favor applying the property tax to railroads. We know very little about the incidence of such taxes except that costs in public utility services are reflected in public utility rates and therefore the burden of such taxes is passed on to the users of the services. Part of the property taxes on railroads might be included in the tax load of the people in agriculture. But since such shifting may eventually influence agricultural output part of the railroad property tax burden will be carried by consumers of farm products.

A third field of study lies in an analysis of production and income effects of public expenditures. Eventually this study should go beyond the field of subsidy and income payments to the broader field of public roads, schools, extension service, etc.

I agree with Mr. Haygood, therefore, that analyzing the tax load of agriculture is one of the most difficult tasks we could undertake. We agree that the concept should receive more attention than it has in the past. But rather than seeking to find some single figure which will be quoted as *the* tax load of agriculture and seeking to isolate each tax according to whether it is considered as a cost or is paid out of income, our investigations may become more significant if we seek to discover the production and income effects of various taxes. This may help us to formulate a tax policy which will be consistent with the goals and objectives of general agricultural policy. Rather than speak in the aggregate to the person who wishes to know the tax load of agriculture it might be more meaningful as well to express the load in terms of agricultural output and farm income.

EXTENSION METHODS

Chairman: Tyrus R. Timm, Agricultural and
Mechanical College of Texas

AN INTRODUCTION TO EXTENSION ECONOMICS*

TYRUS R. TIMM

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THE Smith-Lever Law of 1914 created as a third basic division of the Land-Grant College, "*Cooperative Extension Work in Agriculture and Home Economics*." Shortly thereafter forty-seven Land-Grant Colleges and the United States Department of Agriculture signed memoranda of understanding for the joint conduct of the general program.¹ In consequence of these two epic events, the Agricultural Extension Service is usually said to have been born in 1914. This does not mean that there were no agricultural extension programs earlier. In many states there were.²

Extension specialists in Agricultural Economics have been an integral part of the specialists' staff throughout the thirty-four year life of the extension organization.³ By 1920, there were 110 state extension specialists concentrating on various facets of agricultural economics. After losing some ground in the mid-twenties, the staff numbered 204 by 1930. By 1940 it had increased to 236, and in the latest count, made in 1947, the total had risen to 263.

* A paper given at the Annual Meeting of the American Farm Economic Association, Green Lake, Wisconsin, September 16, 1948

¹ Today only forty-six states operate under the original memoranda. California was the lone exception in 1914, but later Illinois cancelled its agreement. "The two states . . . work in cooperation with the Department and receive funds just as the others," reports H. H. Williamson, Assistant Director, Extension Work, United States Department of Agriculture. In addition to the states, three territories have signed agreements with the Department.

² According to J. L. Boatman, Chief, Division of Subject Matter, Extension Service, United States Department of Agriculture, recently in a paper presented before the Texas Specialists Workshop, ". . . in actual practice, the first agricultural extension worker probably was the American Indian. He taught the Pilgrim fathers how to grow a better crop of corn by placing a fish in the hull with the corn seed." In an address, "The Development of the Extension Ideal in the Association of Land-Grant Colleges and Universities" made in 1944, W. A. Lloyd, Executive Secretary of the Association, said, "In 1907 . . . extension work of some kind was underway in each of the 39 states reporting."

³ In Texas, the first three extension specialists had the following titles, Specialist in Rural Organization, Specialist in Diversification and Cooperative Marketing, and Specialist in Rural Credit. From the Annual Report, Agricultural and Mechanical College of Texas, 1913-14.

Due largely to new marketing projects, the total is estimated now to be well over 300.⁴

Of the total Extension specialists in Agricultural Economics, thirty-one percent are designated either as Economists or Agricultural Economists, twenty-six percent have titles as Farm Management Specialists, whereas seventeen percent are Marketing Specialists. The remainder have a variety of titles. Among these are Specialists in Land Planning, Supervisors of Test Demonstration Farms, and even a Readjustment Specialist.⁵

Neither uniform statistical reports nor job descriptions are required of State Extension Specialists. Consequently, nationwide summaries of their activities are not too reliable. Yet the official county agent report does provide helpful information in classifying the programs of state and county workers. This report is based only on days devoted to specific projects in a county. According to the report, economic specialists just about evenly distributed their time between farm management and marketing, occupying the remaining time (less than 10 percent of the total) with "General Economics."⁶

No information is provided in official reports to gauge properly the amount of Extension work in the challenging field of *public policy*. A survey indicates, however, that the Extension Economics

⁴ Reported by L. M. Vaughn, Extension Economist, Extension Service, United States Department of Agriculture, August 17, 1948. Vaughn cited other related facts "There was practically a doubling of Extension Economists between 1929 and 1930. . . These figures do not include the expansion and contraction which took place from 1938 to 1942 under the name of program planning and land use planning. This group represented a high of about 100 specialists in 1940. While this work was largely under the supervision of Extension Economists, it was not thought of as a subject matter project."

⁵ *Workers in Subjects Pertaining to Agriculture in Land-Grant Colleges and Experiment Stations*, Miscellaneous Publication No. 625, United States Department of Agriculture, July, 1947.

⁶ County Extension Agents annually report the number of days that they devote to the various fields of work and the number of days that specialists spend in the county on specific assignments. Of course, there are many hazards in such a reporting system. For example, days devoted to marketing do not necessarily mean the *economics of marketing*. Furthermore, it is probably an understatement to say that about 8 percent is all the time devoted to *outlook*. There is no doubt a tendency to report as outlook only the general meetings called for that purpose. Much of the outlook work is doubtless included, particularly in connection with commodity meetings, under marketing and distribution. The table below is from the 1947 Annual Report for Extension work in the United States.

staff devoted some twelve percent of its time to problems in this area.⁷

The survey also considered the distribution of the Agricultural Economics staff as to Resident Instruction, Research, and Extension. Forty-four percent of the staff members were in research, thirty percent in extension and twenty-six percent in resident instruction.

Public policy receives more attention in terms of man months in resident instruction than in research or extension. As to farm management and marketing, there are more staff members in research and extension than in resident instruction. As compared with extension, research leads in the number of the staff working on farm management and marketing projects, but extension gives more

DAYS DEVOTED TO FARM MANAGEMENT, GENERAL ECONOMICS, & MARKETING
IN THE COUNTIES—UNITED STATES, 1947, AS REPORTED BY ALL
COUNTY AGENTS (HOME, 4-H, AND AGRICULTURAL)

	By State Extension workers		By County Extension workers	
	Days	Percent	Days	Percent
Farm Management	7,457	47 3	92,201	45 0
General Economics	992	6 3	19,846	9 7
Marketing and Distribution	7,306	46 4	92,642	45 3
Total Days	15,755	100 0	204,689	100 0

OUTLOOK INFORMATION SEPARATE FROM ABOVE CHART

	By State Extension workers		By County Extension workers	
	Days	Percent	Days	Percent
Farm accounts, individual management problems, farm credit, etc.	6,106	38 7	75,483	36 8
Outlook Information	1,351	8 6	16,713	8 2
Total Farm Management	7,457	47.3	92,201	45 0

⁷ This survey was made through questionnaires in March, 1948. Thirty-four states reported. Those states *not* reporting were Alabama, Colorado, Delaware, Georgia, Idaho, Massachusetts, Minnesota, Montana, New York, North Dakota, Oklahoma, Tennessee, Wisconsin, and Wyoming.

attention to public policy.⁸

Another matter of interest is the administrative relationship of Extension specialists to members of the staff serving the other two divisions. This relationship is difficult to summarize. The following information from Mr. Vaughn of the Federal Extension office, however, is enlightening.

"After talking with others here, and after arbitrarily placing a State in one of three categories, they run as follows: About 18 states operate with separate Extension set-ups; 18 as Departmental units; and 12, for all practical purposes, function as Departmental groups, but have separate identity. I would like to add that in giving you this summary, there were a number of states that could have been placed in one group about as easily as another. There were others who were changing their set-ups and are now in sort of a transitory stage."⁹

The chairman recognizes that he has given only a general picture of extension personnel and programs within the framework of Agricultural Economics. It is not a fixed setting but a dynamic one. This brief summary at best is only a "reading" on a very active and widely dispersed venture in mass agricultural education.

The recognition *extension work* is being given at this annual meeting of the Association is another step up the professional ladder for Extension Economists. Many in and out of Extension have been inclined to feel that in the years past, Extension specialists have not contributed to the program of the Association, or shared in the

⁸ Ibid. See table below for ratios computed from the 34 completed questionnaires received.

RATIO OF AGRICULTURAL ECONOMICS STAFF IN RESEARCH AND
EXTENSION AS COMPARED WITH RESIDENT INSTRUCTION

Division	Farm Manage- ment	Market- ing	Public Policy	Other	Total
Res Instruction	1 00	1 00	1.00	1 00	1.00
Research	2 17	2 45	.57	1.01	1.74
Extension	1 55	1.59	.69	.51	1.16

⁹ Part of a letter received from L. M. Vaughn, Extension Economist, Extension Service, United States Department of Agriculture, Washington, D. C., August 17, 1948.

confidence of its leaders, as they should. This roundtable provides the opportunity for erasing such misgivings.

Extension Specialists in Economics, to use the vernacular, *have come a long way*. And to my mind, there is an attendant corollary—*we have come up the hard way*. Extension administrators have been drawn largely from the physical sciences.¹⁰ In the development of a well-rounded program in Agricultural Economics, resident instruction led the parade, followed by research, with extension as a late starter. There was the trying task of winning professional prestige from fellow scientists on the one hand and in the eyes of the “dirt farmer” on the other.

Today, our discussion centers on Extension Methods. There can be no more important topic. The significance of this is reflected in the stacks of un-called-for bulletins written by some specialists indifferent to proper methodology. Farmers noisily leaving during a community meeting, as occasionally happens, is further evidence of the importance of sound methods to effective Extension programs.

In view of the importance of methodology, four well-qualified Extension Economists have been asked to discuss significant phases of useful techniques in four Extension programs. These are agricultural policy, marketing, farm management, and economic principles.

¹⁰ In twenty-two states there are one or more Extension administrators who have held appointments as Extension Economists or who have done graduate work in Economics leading toward advanced degrees. Among these are H. R. Baker, Assistant Director, Arizona, C. O. Youngstrom, Assistant Director, Idaho, T. P. Cooper, Director, Kentucky, H. C. Sanders, Director, Louisiana, W. A. Munson, Director, Massachusetts; and H. A. Berg, Assistant Director, Michigan. From a report prepared by Z. L. Galloway, Extension Economist, Extension Service, United States Department of Agriculture, Washington, D. C., September 7, 1948.

Of course, social scientists are extremely fortunate in having Director M. L. Wilson as the national head of Extension work. He is not only internationally known for his work in agricultural economics and rural sociology, but his general guidance and unswerving interest and confidence have helped tremendously throughout the nation in securing expansion and improving the Extension programs geared toward the *economic life* of the farmer.

USEFUL TECHNIQUES IN AN EXTENSION PROGRAM IN AGRICULTURAL POLICY*

J. CARROLL BOTTUM
Purdue University

AGRICULTURAL policy decisions depend not only upon economic factors but also upon one's philosophy of the function of government and the national and international political environment in which we are operating at any given period. For this reason, the approach made to problems in the public policy field becomes particularly important as well as the techniques used. Public policy questions do not lend themselves to precise answers. There are usually a number of alternatives depending upon the assumptions made. They, likewise, often deal with areas concerning which the farmer does not have first hand experience and knowledge.

It is particularly important in this field that the educator makes clear his assumptions and so conducts himself that he does not appear to have a bill of goods to sell because of either his personal beliefs or political bias. His approach must be one of working through the problem and analyzing the various alternatives to see where each may lead. Insofar as possible, the principles and illustrations should be drawn from experiences of the participants. Just as we go to the margins in our economic theory we must go to the extremes in illustrating points in public policy. For example, a proposal to support the price of buggy whips at 90 percent of the 1910-14 parity helps illustrate a principle that may be more difficult to see when applied only to agricultural products.

Timing is particularly important in doing work in this area. Information on public policy questions should be gotten out ahead of the time when the decision is being made and positions have been taken. Yet, educational work can not be done on particular issues too far in advance when there is no interest in the issue.

Because of the controversial nature of the problems involved in agricultural policy, they can best be presented to small groups where there is ample opportunity for full discussion. Therefore, as the first technique, I should like to suggest the discussion approach. As a basis for the discussion, factual tables and charts illustrating

* A paper given at the Annual Meeting of the American Farm Economic Association, Green Lake, Wisconsin, September 16, 1948.

the problems and principles involved may be effectively used. It is desirable that the sources of all data be clearly given so that if anyone questions the data it may be readily checked. Needless to say, the most reliable and respected sources in the eyes of the group should be used. In the use of such handbooks in Indiana we have avoided written interpretation of the data other than certain factual statements. In most states there are local or township groups associated with the farm organizations or other organizations which meet regularly. In certain instances materials have been prepared along the agricultural policy line for these groups to use as the basis of their discussion. The discussion is then handled by the local leader. We need to provide the materials and help create the environment for self-education in the policy area.

The larger meeting where the lecture method is used has its place in an educational program in agricultural policy. However, its usefulness in this field is more limited than many other fields. In the present stage of development it appears to me more desirable to work with the Agricultural leaders. This may be at the county level or at the state level. Public forums on a state basis or a district basis where authorities in the various public policy fields may be brought together have proved a useful technique for extending information in public policy.

The distribution to leaders of circulars, bulletins, and talks by prominent individuals taking different viewpoints may be used effectively. Here again, every effort must be made to bring together the different viewpoints so that the materials sent out do not appear as one sided. The "Agricultural Policy" quarterly published by the Iowa State College Press meets a real need in this area.

Extension personnel may make a contribution working directly with committees, farm organizations and groups who are taking definite positions or making definite recommendations in connection with the agricultural policy. In this capacity, the specialist must be careful to recognize that his function is one of presenting facts and interpreting them to the group he is assisting rather than allowing himself to be drawn into taking a position and in helping make the decision that should be followed.

Movie films may be used to get across certain general ideas. The picture "Round Trip," prepared by the Twentieth Century Fund, is probably a good example of a film in this field which has helped people to understand some of the problems of international trade.

Featured articles in agricultural weekly and monthly publications may be used to a limited extent.

One of the necessities for developing an extension program of agricultural policy is a more thorough understanding by the county agricultural agents of the problems involved in agricultural policy and the importance of working in this field. This training may be done at district county agent conferences, at annual conferences and through special courses. Coupled with this must be a stepped-up research program in the policy field.

Educational programs in agricultural policy are relatively new among the extension activities. Problems in this area, however, are becoming increasingly important to the farmer. The extension service job is to help the farmer with his problems. Therefore, this is an era in which we must give added service. In so doing we must obtain the confidence of those with whom we are working in regard to our objectivity. This means we must avoid the sensational and not attempt to move so fast on any issue that we appear to be advocates of a certain program. Education is relatively slow in this field as in all fields, but if we build it soundly I believe farm groups and farm people will come to have the same confidence in our analysis of problems in this field as they now have in the production, the farm management, and the outlook fields.

USEFUL TECHNIQUES IN AN EXTENSION MARKETING PROGRAM*

L. F. STICE
University of Illinois

THE most obvious approach to a discussion of this topic would be to list and evaluate the teaching methods most commonly used in extension and to illustrate how these have been used in certain marketing projects. Certainly the effective use of market tours, radio, written materials, meetings, and discussion groups could be discussed by extension workers with profitable results. At present, however, I am more concerned with what has been termed "approaches" to doing extension marketing work rather than with specific teaching aids.

Because of the numerous phases of marketing work which need attention, the specialized problems for particular products, and the different groups of people involved, the major problem for most state extension marketing economists is to decide how they can most effectively use their time and resources. The Extension Service is responsible for an educational program in marketing which in part includes providing and interpreting market news and outlook information; organizing and guiding farmer cooperatives; extending and improving grading and inspection services; promoting programs to increase the consumption of agricultural products; keeping producers, processors, distributors, and consumers informed as to the economic significance of new developments in processing, packaging, and merchandising; and providing information to handlers and other market intermediaries on methods of improving operating efficiency.

More specifically the problem is to develop procedures for reaching and working with the various groups of people, i.e., producers, handlers, and consumers. From my own experience I am led to believe the most effective approach is, first, to gain the confidence and respect of those actually engaged in carrying out the marketing processes. We gain this confidence, are called upon for help in solving acute marketing problems, and are in a better position to initiate long-time improvements only if we are thoroughly familiar

* A paper given at the Annual Meeting of the American Farm Economic Association, Green Lake, Wisconsin, September 16, 1948.

with conditions peculiar to each commodity. In business parlance, an extension marketing economist must build up a "clientele" of people who are interested in a particular commodity or marketing problem. Unless the extension worker is considered somewhat of an authority in specialized marketing subject-matter, he is not likely to have a very large "clientele."

Obviously, it is not possible for one extension marketing economist to be an authority in several commodity fields. And in states where there are only one or two people in extension marketing a more general approach is almost essential.

Our situation and program in Illinois may illustrate both approaches, i.e., the commodity and service approach and the general economic approach. At the College we have teaching and research specialists in each of four commodity fields but only two men in extension marketing. The two persons with extension appointments have had the major responsibility for outlook and agricultural policy projects and have had little time for work along commodity and organizational lines. In addition to our College staff there are several well-staffed farmers' cooperatives operating in the important commodity fields. In general, the personnel of these organizations have taken care of the promotional and specialized service needs.

Under these circumstances we have felt our major contribution should be to provide farmers, their leaders, and trades people with factual economic information which would guide their policies in developing new programs and adjusting methods of operations. More often than not, requests for this type of assistance come direct to the person in the teaching and research who is specializing in the commodity with which the people are concerned. The extension staff has frequently helped with investigational studies which might be needed to answer specific questions or to point out desirable adjustments in marketing procedures.

Participation in these studies by the extension economist has not only increased his knowledge but has also provided a valuable contact with farm leaders and trades people which later has been useful in the conduct of broader projects.

Our present program is grain elevator management training illustrates this point. Because of contacts made in grain elevator studies and surveys, we were able to get the country grain trade, both independent and cooperative, to co-sponsor this program. As

a result of their participation, we believe the type of instruction has been superior and the general success of the program greater than it could have otherwise been.

As specific projects have led into more general programs, likewise general educational programs have given us the opportunity to work with leaders on specific commodity problems. Our fall livestock outlook meetings are an example. They are planned and participated in by the Departments of Agricultural Economics and Animal Science of the College, the Illinois Agricultural Association, and the cooperative marketing agencies serving the state. Largely because of this project we attend quarterly meetings of managers and directors of these cooperatives where livestock marketing problems are discussed. Thus we have a medium for keeping in close contact with developments and an opportunity to work on specific phases of livestock marketing which need attention.

A somewhat different approach in extension teaching was used several years ago with some success. The Department of Agricultural Economics held a series of agricultural economics study school for farmers at the county level. Reference and discussion outline materials were prepared and placed in the hands of those enrolled prior to the meetings. The topics dealing with marketing were "Basic Facts about Marketing," "Basic Facts Concerning Cooperative Marketing," and "Increasing Efficiency of Marketing." Because of the increasing demands on our time from other projects we discontinued this project during the war. It is significant, however, that after ten years we still have requests from individual farmers for these schools.

In summary, I believe the most effective extension teaching in marketing must be done with leaders and agencies who are occupied with day to day marketing problems. We can only gain and maintain the confidence of these people and have the opportunity to advise if we are well informed along the lines in which they are interested. Once we have this confidence we are in a position not only to render invaluable service in an advisory capacity, but we can also obtain information which is essential if we are to suggest improvements.

USEFUL TECHNIQUES IN AN EXTENSION PROGRAM IN FARM MANAGEMENT*

Z. L. GALLOWAY

U. S. Department of Agriculture

FARM management extension as it is carried on in the States today is broad and diverse. It includes educational work on farm management phases of farm planning and county planning, farm records and their analysis, enterprise records, farm surveys, farm business problems, farm labor utilization and efficiency, farm tenure, economic information and outlook, statistical information service to State and county extension workers, farm finance, land utilization, and national policy and economic forces. The problem of keeping up to date and abreast of new technical developments in the subject matter field as well as in educational procedure is an important part of the specialist's assignment.

Numerous techniques have been used in carrying on extension programs in the broad field of farm management. Some of them have been very effective; others not so effective. Our need now is for techniques which will reach a maximum number of people with the limited amount of trained personnel available. Training of agents and farm leaders has materially increased specialists' efficiency in some States where definite attention has been given to this angle of the work.

To be more effective in our farm management education, we must endeavor to make the subject matter simple and interesting rather than complex, confounding, and confusing. We must spend more time, whatever the technique, thinking about our audience and its level of understanding, and then prepare our material so it can be understood by that audience.

In the time available to me, I would like for us to take a look at some of the teaching techniques used in farm management which have proved or promised to be more effective in reaching farmers. In order to save time, point up the discussion, and possibly be more specific, let us take a recognized farm management problem and examine a few of the extension techniques which may be used effectively in the teaching process. I think the problem of proper land use will serve our purposes quite satisfactorily.

* A paper given at the Annual Meeting of the American Farm Economic Association, Green Lake, Wisconsin, September 16, 1948.

In order to generate interest in the problem and suggest possible methods of solution, the illustrated lecture may be used effectively. It makes use of slides, models, charts, and other means of illustrating the ideas presented, in terms which the audience can understand and appreciate. Color slides from local farms are more effective; however, charts, graphs, and diagrams can be used to good effect preferably by photographing with appropriate settings. Brief mimeographed notes or some printed summary of the lecture content which may be handed out at the close of the discussion, are helpful as take-home material.

Group discussion also may be used to increase interest in the subject, develop a feeling of need, and a desire to do something about the problem on the individual farm. This technique has been used in a limited way by extension workers for many years. It is doubtful, however, if its full possibilities have been realized in the field of farm management. The process is based upon the fact that everyone likes to talk and express himself or at least ask questions. In farm management its value also is based upon the fact that operating farmers have experience and information of value to their neighbors and the further fact that all wisdom in the field is not resident on the college campus. The type of procedure used in conducting the discussion is not too important. It is important to organize the group so that everyone has an opportunity to hear and be heard, to express his opinion, and to disagree with the other fellow. There are, of course, recognized principles for effective group discussion which should be followed for best results.

The many forms of written or printed material, from circular letters and news stories to bulletins, may be used to generate interest or to give specific information about our problem of proper land use. Handled with skill, the written word can be effective in farm management education work. Too often, however, we have failed to give full consideration to the readability of our writing. We have written with our fellow workers in mind rather than the farmer and his family.

In our extension readability unit in Washington we have been measuring the reading difficulty of our extension publications to find out whether they are pitched at the best reading level. While economic material is probably among the most difficult to write for easy reading, some of our extension economists have succeeded

in doing just that (EXHIBIT of State extension publications on economic subjects rated average reading level or below). The important thing is to consider your potential reader and his reading ability, and prepare your material so he can read it with ease. Many of you are familiar with the study made by *Wallaces' Farmer* which indicated that "plain talk" increased readership 45 percent to 56 percent.

The farm tour is another teaching technique which we may use effectively in connection with our problem of proper land use. It is a most effective method of teaching farm management facts when properly handled. While we know many elements of success of farm tours, much remains to be learned about the most effective methods of planning and conducting them. In some States extension economists have had success in tying in a competitive angle to add interest. In a current publication on *Extension Methods*, the Montana Extension Service, for example, devotes seven pages to effective methods of handling tours.

In connection with our problem of proper land use, the method demonstration may be used effectively. In open weather the demonstration can be made on the farm where the various soil types or land use classifications can be pointed out and the best methods of rearranging farm layout to secure good land use can be discussed. During unfavorable weather proper land use can be demonstrated, not so well, perhaps, with the use of a farm map, kodachrome slides, and other visual aids in a comfortable room. While careful plans must be made in advance, the method demonstration has great possibilities in the field of farm management as a substitute for the straight lecture. It is calculated to show the listener how to do the job step by step, let him ask questions, and possibly do the job himself for his own farm.

Work forms which the farmer can use in thinking through his problems must be developed for use in the demonstration if it is to be effective in most farm management teaching jobs. Often the make-up of these forms is the most significant factor in the success of the teaching process. In our problem of proper land use, for example, the skill with which the work forms are prepared and presented determine in large measure the amount of learning taking place. Likewise, in the farm management phases of farm planning the construction of the forms used is an important element in the

success of the educational processes taking place and in the portion of the plan carried into action. Thus working forms become an important teaching device in this field.

The result demonstration also may be used advantageously to inform farmers about proper land use, the results that can be expected, and to move them to action. For many purposes in farm management education this technique can be used best in connection with the farm tour. Thus organized groups of farmers can observe the results of improved farm organization and management. In the past much of our extension teaching in effective farm organization, farm planning, farm layout, farm labor utilization, farm records and the like, has utilized this technique. There are, however, further opportunities for increasing the effectiveness of this accepted extension method in the field of farm management. We need to keep in mind that from an educational standpoint the result demonstration is useful only as a means to an end and not as an end in itself.

While I have used this one problem of proper land use to bring out a few of the teaching techniques useful in the farm management field, these same techniques can be used effectively with other phases of farm management education. I realize, of course, that I have not mentioned many of the educational techniques which are useful in the field of farm management.

USEFUL TECHNIQUES IN AN EXTENSION PROGRAM IN ECONOMIC PRINCIPLES AS APPLIED TO AGRICULTURE*

WALLACE OGG
Iowa State College

I BELIEVE it is generally recognized in adult work that we do not have a program of teaching principles as such. We teach principles related to a problem as we study the problem.

Let us begin by a brief consideration of the economic principles that apply to agriculture. In general, we may say that wherever the necessary resources are scarce and there are competing ends to be maximized from the use of these resources economic principles apply.

The important tools for the analysis of problems in farm management are those supplied by economic principles. Given sufficient information these principles could give us mathematically exact answers. In lieu of this information they form the basis for judgment about what size, in terms of resources used, the business should be; allocation of resources between the enterprises on the farm; and the practices that are consistent with the limited resources. The theory for meeting the problems of price and production uncertainty are much less precise but do serve also as guides to judgment.

In home management also the really significant problems can only be analyzed in the framework provided by economic principles. The problem is a maximum of family satisfaction from various family goals, like health, security, and community participation. The scarce resources are income, family skills, time, and the inventory of things the family has for living.

Also in the area of public policy economic principles are an important tool for understanding and analysis. Price policy, trade policy, the problems of congestion of underemployed people, to mention only a few, all require for analysis economic principles. The problems of inflation and employment, so important to agriculture because of their effect on price instability, may be understood only by using the tools furnished by the general theory of expenditures and their effect on employment of resources.

* A paper given at the Annual Meeting of the American Farm Economic Association, Green Lake, Wisconsin, September 16, 1948.

To teach farm people the things we are interested in teaching them it is necessary that we teach these principles and their application. It is no easy task.

The question is, how can we do it?

There are two alternatives I should like to mention. The first is in general use. The second I should like to propose for consideration. The first is to make no explicit reference to the principles but to illustrate them, hoping to teach the ideas from our illustrations.

The second is to state the relevant principles as simply and clearly as possible, then to relate all of our illustrative material to the principles. This technique runs the risk of frightening people. They may feel we are too abstract and we may lose them at the start. Limited experience does not, however, justify this fear.

An important consideration in how to teach principles is to whom should we teach principles? May I suggest a priority rating?

We should begin at home. We ought to see to it that our own staff has a thorough understanding of the principles.

Second in the priority scale is teaching the principles to our production specialists; then, in order, to our county extension staff; to county and state volunteer leaders, and, finally, to the rank and file.

We have had some recent experience at Iowa State in teaching all these principles to all of these different groups and the results have been encouraging.

We recently added to our staff in economics a man with his graduate training in Animal Husbandry and with very little training in economics. We think we are on the way to making him into an economist well founded on economic principles.

Two years ago we tackled the job of teaching the general theory of expenditure and employment to a group of state and county farm leaders in one two hour session. They liked it well enough to ask for a similar session once a month.

We have tried teaching the theory of the firm as background to farm management with numerous groups of farmers, specialists and county agents. With one farm group we deliberately pitched it at a level we thought they might have trouble following to see what could be done. Two months later the county agent called on us and quoted several people as saying that that meeting grew on them. It dealt with the real problems. They asked him to have us back for more.

We are convinced that rather difficult principles can be taught, as principles, to any of these groups if they apply to problems in which they are interested. We believe that by so teaching principles we can eliminate confusion and teach our subject matter for clearer understanding.

RESEARCH METHODS

Chairman: Warren C. Waite, University of Minnesota

RESEARCH IN PUBLIC POLICY*

WILLARD W. COCHRANE
The Pennsylvania State College

I.

WHEN Warren Waite asked me to prepare a paper for these meetings on the subject of research in public policy, I accepted readily for I have a keen interest in this field of work. But when I began to write I found it exceedingly difficult to know where to begin or what to say. There seemed no accessible handles by which to come to grips with the problem. I made little or no progress until I asked myself the specific question and tried to answer—what do we mean by research in public policy? They by the process of eliminating untenable definitions I arrived at a definition of research in public policy which seemed to be workable.

Research in public policy, it seems to me, must mean *that analytical work concerned with tracing the consequences of pursuing a given policy*. Public agencies, in their pursuit of a given policy, cannot help but create stimuli—stimuli which set in motion forces or sequences of events, which have ultimate consequences. And since we are economists it may be assumed that we are concerned primarily with economic consequences. Although the economist may on occasion be called upon to serve as a generalist or to contribute to a general project which seeks to trace *all* consequences which flow from a given stimulus, for too great specialization in this field can confuse rather than aid the policy maker who must be concerned with the whole gamut of ends, values and interests.

At this point it does not matter whether a given policy involves action of a positive nature or the absence of action. The failure to act can serve, just as potently as action itself, to set up interactions having ultimate consequences to some or all of us. Further, for purposes of research the policy action employed as economic stimulus may be historical, current or assumed; an analysis stemming from a postulated stimulus may prove more useful in this policy field than a historical one.

* A paper given at the Annual Meeting of the American Farm Economic Association, Green Lake, Wisconsin, September 16, 1948.

To illustrate research along the lines discussed above let me cite three examples from an extremely limited field. The first and most comprehensive is the study made by Nourse, Davis and Black under the auspices of The Brookings Institution in 1937 entitled *Three Years of the Agricultural Adjustment Administration*. The conclusions of this study are not as sharp as a person seeking counsel might desire, as there does not appear to have been complete unanimity among the three authors. Nevertheless, it is a good example of a full-blown research job in public policy where the researchers appraise the consequences of a given program in American agriculture. Some years later Professor Schultz and O. H. Brownlee at Iowa State College in a bulletin entitled *Effects of Crop Acreage Control Features of AAA on Feed Production in 11 Midwest States* did another job on the Triple A. Their study is not so comprehensive as that of Nourse, Davis and Black but it is more precise in nature, makes greater use of quantitative information, and comes out with sharper conclusions. The consequences of crop control on feed production are clearly shown. To cite one more example, O. H. Brownlee in the *JOURNAL OF FARM ECONOMICS*, February 1948, in a short article entitled "Marketing Research and Welfare Economics" does, it seems to me, an exceedingly good job in a purely qualitative way of appraising the policy consequences of the Research and Marketing Act of 1946. Here the author, despite some fancy economic "lingo," traces the policy consequences of the act in terms of income expectations in a way that should give pause to those responsible for the administration of the Act.

Too often we do not get this latter type of research in public policy. Rather, we get policy statements of an editorial nature. This is not to argue against the presentation of informed opinions. In absolute terms I think all too few statements of this type have been prepared by qualified agricultural economists. The older men in our field who have had much experience in research and with the workings of action programs owe it to the public to make personal statements on agricultural policy. But let me hasten to add that statements of opinion need not and should not become the exclusive field of elder statesmen. Otherwise this paper would never have been prepared for it too represents a statement of opinion on policy.

Now that we have paid our respects to opinion writing, let us not, in our zest to present a case, particularly on broad national issues

that are not easily managed in an analytical way, confuse an informed opinion with research in public policy. By research in public policy we mean a study of the economic consequences flowing from actions taken (or considered) in the pursuit of a given policy; unfortunately rigorous research of this type has been a rare product in our field. Hence, this paper represents a plea for more research in the economics of agriculture which has as its subject matter the consequences of public action.

II.

In the field of agricultural economics it would seem that research in public policy is most often assumed to be the proper domain of government—particularly the Federal Government. This follows, I guess, from the fact that the Federal Government, over the past two decades, has pursued policies in agriculture involving many and varied action programs. But the plain facts are that the Federal Government, with its many agencies concerned with agriculture, is a poor and illogical place in which to carry on research in agricultural policy. Moreover, little intensive analytical work concerned with policy and its consequences does actually get done in the government. And if we reflect for a moment on the function of government, I think it will become clear why government research agencies cannot easily and readily do research in public policy. The Federal Government is organized and administered by political organizations or groups owing allegiance to countless and varying interests. A political group comes into power by promising to carry out certain policies and remains in power so long as the policies which it does pursue satisfy a coalition of forces which can maintain it in power. Thus it is illogical to expect a political administration to conduct research in the field of policy which may prove damaging to itself. I am not saying now that a political administration as it exists in the United States Department of Agriculture is not concerned with policy; on the contrary, policy is its principal concern. The compromising of special interests to mold a policy which will command the support of a dominant coalition of forces is the major activity of a political administration.

But to return to research work in the U.S.D.A.; research work in the field of economic policy more often resembles a legal brief than the product of a professional economist. The policy research that takes place in the Federal Government is more often concerned

with the support or defense of a policy than with an analysis of its consequences. Here, then, is the problem of conducting policy research in government. The party or group in power must of necessity be prejudiced in its own behalf. Consequently it must demand that research in policy be conducted in such a way as to support it, not detract from it.

There are exceptions of course. There are certain men in the Federal Government that all of us know who are so interested in policy and are endowed with such creative talents that regardless of the situation or the demands of politics they will do research in policy in the sense developed here. Also, there are periods in the development of new policies or new agencies or new programs, usually early in their development, when the administrator consciously seeks unprejudiced analyses of the economic consequences of this policy or that. But these are the exception. The norm, in the field of policy research, is that of producing reasoned arguments to support policies already formulated through political compromise.

What, then, should we expect in the way of research from governmental research agencies? On the basis of past experience and the logic of the argument developed above I would say that economic research in the government, and in this case the U.S.D.A., must be primarily concerned with the *measurement* of economic phenomena. The federal agencies have demonstrated their ability many times over in the collection of statistical material, in its assembly and refinement, and with the final descriptive measurements of economic activity. The federal agencies concerned with agriculture have the funds for the costly collection of statistical data; also, this type of research activity avoids the nasty distribution implications of political significance so often associated with economic analysis and almost always associated with policy analysis. Hence, I am inclined to believe that concern with economic measurement will dominate government research in the future as it does at present.

This brings us to the role that Colleges of Agriculture in the Land Grant Institutions should play in the field of policy research. I would argue that in the past research in policy has by and large been neglected in the State Colleges of Agriculture. The typical research project in the typical Department of Agricultural Economics is concerned with a non-policy problem within the State. Very often these projects involve a brief survey, some analysis of the information gathered, and the presentation of conclusions or recom-

mendations. With this I have no basic disagreement. But I would argue that a larger proportion of land-grant research resources be oriented toward research in economic policy.

Perhaps the State Colleges of Agriculture have felt that the proper place for research in public policy is in the Federal Government where the formulation of economic policy and its execution are largely carried out in the field of agriculture. If this is the reason for neglect in the field of policy research I hope sufficient argument has been presented to indicate the fallacy of such thinking. Perhaps the cause of the neglect stems from the fact that research projects in the field of public policy are considered difficult to formulate and not easily manageable—that research in public policy does not lend itself to the rigorous type of analysis usually associated with scientific work. If that is the cause of the general neglect I hope that an adequate methodology will be developed later in this paper to eliminate that cause.

As with all generalizations, there are exceptions. Certain of our Colleges of Agriculture have, in well-defined periods of their history, taken a keen interest in public policy, e g., Cornell, Wisconsin, Minnesota and Iowa State. And I am convinced that it was the concern of those institutions with public policy, even though research in the sense defined here may have played a small role as compared with the preparation of informed opinions, that made those institutions great and influential in our field. Further, a certain amount of rigorous research in public policy has, over the past two decades, been going on in private institutions. Considerable research effort has been concentrated in the field of agricultural policy at the Universities of Harvard, Chicago, and Stanford and The Brookings Institution. And there is every reason to believe that such work will continue. Thus, a slender but nevertheless important work has been going on over the years.

Only two difficulties arise with the work that has been done in the past: (1) there has been too little of it, and (2) there has been a tendency to confuse precise analytical work in the field of public policy with statements of an editorial nature based on value judgments. To overcome the first difficulty, it is obvious that more importance must be attached to this type of research and more resources devoted to it. But to overcome the second difficulty, notably the tendency for research in public policy to take the form of editorial statements at best or to degenerate to the level of bar-room

arguments at worst, it seems necessary to spend some time on research methodology

III.

I have repeatedly emphasized in this paper the role of consequences in policy research, perhaps to the point of boredom, but I hope not. I have placed strong emphasis on the consequences of action in policy research for two principal reasons: (1) it is the only way to introduce rigor and precision into policy research, and (2) the presentation of information in the form of the consequences is an effective technique for aiding policy-makers in the formulation of policy, and for helping the man in the street to choose between different policy alternatives.

As the mechanism of government becomes more intricate because of countless interventions in the operating economy, and in our case the agricultural segment of the economy, all of us, the legislator, the administrator, the farmer, and the consumer, become more in need of some way of appraising actions taken by government. We need more than the platitudes of politicians, more than the prejudiced arguments of special interests, and more than the informed opinions of public-spirited individuals or agricultural economists. For a given policy or program may be good in one context and a positive evil in another; may have beneficial effects in one period and work havoc in another. Probably in every case the consequences traced out and defined, and measured quantitatively if possible, will disadvantage some and favor others. But if we know who it is that is being disadvantaged and to what extent, and who it is that is being favored, and to what extent, then the policy-makers will be in a better position to redirect present policies and formulate new ones.

This line of thought is not new with me. Most of the ideas presented here—particularly those that emphasize the consequences of policy actions—have been stated before and in a more eloquent manner by Joseph Spigelman in a series of articles running from July through September, 1946, in *Harper's Magazine*. To quote from Mr. Spigelman's article of August, 1946:

" . . . No policy, no plan or program, no proposal for action, is wrong in itself so long as it is intended to satisfy positive needs and not merely to harm other people. What is wrong is the effect of satisfying these needs upon the satisfaction of other needs. Government regulation, for example,

is wrong not because of irrelevant abstractions adduced by the theorist, but only to the extent that it impairs freedoms actually valued. A subsidy is wrong, not for itself, but only if it disadvantages those not so favored or if it proves ultimately disadvantageous to the recipients themselves. What alone matters about any course of action are its consequences."

But beyond the need for policy research which stresses consequences, rests the fact that by stressing consequences we are forced to conduct research along lines which traditionally have been considered scientific. It provides a vehicle for analyzing cause and effect relationships with quantitative data. It permits us to move out of the realm of opinion and toward the realm of fact. And because I think the failure to understand how to conduct rigorous research in public policy has been an important cause of the general failure to do this type of research in agriculture, I should like to outline the procedural steps in a research project which stresses the consequences of action:

- (1) We must first choose the policy or program or action which is to be the focal point of the project. Probably we will choose this stimulus because it in some way affects us or affects the interests with which we are associated.
- (2) We must know and be able to define the economic situation or milieu which is relevant to the action introduced, for it is the dimensions of this situation which will be changed or modified by the stimulus. If possible, the economic dimensions of the situation should be defined in quantitative terms, indicating, for example, quantity of product, income of operators, volume of employment, etc.
- (3) We introduce a government action through the vehicle of a program to provide a stimulus and set in motion a sequence of events or interactions.
- (4) We trace and describe the sequences of events or interactions which flow from the introduction of an economic stimulus in the form of a government program.
- (5) To accomplish (4), we use economic and statistical concepts developed for other purposes, correlation analysis, sampling technique, demand functions, supply functions, time-preference concepts, theories of money and employment, and what-have-you.
- (6) The point of all this is to discover who is affected by the economic stimulus, and to report how they are affected and to what extent.

This type of research is obviously not limited to economics or agricultural economics. It could, for example, be used just as well in a sociological or medical policy inquiry. It may be qualitative or quantitative in nature, recognizing, of course, that insofar as it is

quantitative in nature and permits measurement, it leaves less room for individual interpretation. In brief, a methodological process has been outlined, not an analytical procedure, and the analytical procedure will vary with the researcher and the problem. The thing to remember in all this is the basic idea of consequences—their discovery and measurement.

On a different level, this *type of analysis need not be limited to historical acts of policy*. We may want to concern ourselves with the probable consequences of an act that has not as yet been taken (e.g. over the past few years, several of us have tried to isolate and measure the economic consequences of a Food Allotment Program—a program which has not as yet been written into legislation). In assuming a policy action, we have for research purposes created a stimulus which has consequences. That is all we need to start an analysis. And insofar as we can postulate with concreteness the economic situation in which the stimulus is to be introduced, we can conduct an analysis using an assumed stimulus in a manner just as effective as with an historical one—the logic of the procedure is the same in either case.

The type of analysis under discussion here, and by inference strongly recommended, may or may not appear novel, depending in large measure on how much each of you may have considered the problems involved in doing policy research. But I should like to point out that there is a certain amount of orthodoxy in the process described. It has been used as a pedagogic device many times in the past. Alfred Marshall, you will remember, introduced in his analysis of rents a tax on hop production in one case, a tax on printing presses in another, and a tax on printing materials in still another. In each of these cases he traced the economic consequences on rents and quasi-rents that flowed from the introduction of the tax stimulus. Now I ask—why can't present day economists plying their trade in the field of agriculture employ the same general procedure?

IV.

It is impossible to discuss research in the economics of agriculture these days without some reference to the Research and Marketing Act of 1946. It overshadows all else on this topic. But where does research in public policy tie into the Research and Marketing

Act of 1946? I think there is a close tie between the subject of research in public policy and the Act. But first we need to look at the work going on currently under the provisions of the Act.¹

The expanded research in marketing under the Act, although not exclusively under the direction of the Secretary of Agriculture, for some funds under Title I are designated for research in marketing in the States, is primarily under the direction of the Secretary of Agriculture in the Federal Government. In its research work in marketing, the Department of Agriculture is resisting pressure to make dramatic exposures of irregularities in the marketing system. The persons responsible for research in marketing in the Department do not feel that much is to be gained by highlighting examples of wide profit margins here and there, and thus imply that the entire marketing system may be operating along similar lines. Rather, the Department, in its research, is pursuing a tried and tested policy concerned with the *measurement* of marketing activities. It is trying to collect better information; it is trying to collect more timely information; and it is trying to organize marketing data in more meaningful ways and thus make available more precise, quantitative information about the marketing system. This, you will remember, in an earlier part of this paper, was pointed out to be the traditional role of government in research. This is what government prefers to do and what it does well.

Research in new and expanded uses for agricultural products has been taken away from the economists and given to the technologists in the regional laboratories. Since that ill-fated night in the fall of 1945 when the winners of the price-policy contest sponsored by this Association were unveiled to Congressional leaders, it seems Congress has lost faith in the ability of economists to find miraculous solutions to the problems of farm prices and surpluses. The prize-winning economists did not show themselves capable of finding ways and means of permitting agricultural interests to charge prices that they alone deem adequate and then make consumers take farm products at those prices. Thus the job of working miracles has been turned over to the technologists.

But the people responsible for research under Section 10 (a) into new and expanded uses of agricultural products are worried. They

¹ See the brochure recently released by the National Planning Association entitled *The Agricultural Research and Marketing Act of 1946—A Consideration of Basic Objectives and Procedures*,² for an informative review of the Act.

can see that the research along these lines may get into hot water, and soon, if the technologists are unable to come up with some revolutionary new uses. Now all of us know that food products, when considered in the aggregate, have an extremely inelastic demand. And certainly some of the commodities most likely to be in trouble (e.g. potatoes and wheat) have an inelastic demand. It is not easy to increase the demand for these products, and revolutionary new uses are hard to find for potatoes even in wartime. Thus, if and when prices begin to sag on some, if not all, agricultural commodities, and the great new uses hoped for have not materialized, Congress is very likely to feel that it has been cheated. And if reasonable and alternative policy solutions are not on exhibit, Congressional leaders may be inclined to feel that the Research and Marketing Act of 1946 was just another operation rat hole.

It is this clear directive in the Research and Marketing Act of 1946 which represents a danger zone for research workers in agriculture. It seeks a miraculous solution to surpluses, if and when they develop, but I for one don't think the miracle will happen. And failure in one part of the Act can easily reflect adversely on the other parts.

Title I of the Act provides additional funds for general research into the laws and principles of agriculture—the research to be carried on primarily under the auspices of the State Agricultural Experiment Stations. Here the directive is broad—broad enough to include the type of research in policy that we are discussing here without any stretching of the letter or spirit of the Act. But from the little I have observed, and I would be the first to admit that my observations have been casual, I would say that research in the States, as in the Federal Government, is proceeding along traditional lines. Except in rare cases research in public policy is playing no more important a role in State research programs under the New Act than it did before.

This development, or more properly lack of development, is unfortunate; for, as the National Planning Association has forcibly pointed out, Congress is expecting from all this research an income effect to the benefit of agriculture. But a large and significant income effect to the benefit of agriculture does not appear to be even a possibility, let alone a probability. To quote from the National Planning Association brochure:

"It is no derogation of the importance of research looking to the improve-

ment of marketing methods and organization to point out that more efficient marketing will not in itself make the difference between five-cent hogs and thirty-cent hogs, or between fifty-cent wheat and two-dollar wheat, or between eight-cent cotton and thirty-cent cotton. These differences in price have occurred under marketing techniques and organization that were essentially identical. The price of pork may be affected far more importantly by the level of industrial employment than by methods of marketing; that of wheat and cotton, by national and international trade policies than by the specific methods used in the selling of products."

What specifically can and should be done? I would argue that the administrators of the Research and Marketing Act in the United States Department of Agriculture should encourage and the administrators of research in the State Colleges of Agriculture should feel compelled to get underway policy research that deals with the basic income issues raised by the Act. I would suggest research projects in policy along the following lines:

- (1) Research into the consequences of pursuing the current policy which seeks discovery and adoption of new and expanded uses of agricultural commodities if and when they should come into surplus.
- (2) Research into the consequences of actions designed to shift agricultural resources away from the production of low-resource-using commodities into the production of high-resource-using commodities, e g, from potatoes to butter.
- (3) Research into the problems and consequences of expanding food consumption domestically in periods of low prices through the development and expansion of special consumption programs.
- (4) Research into the consequences of expanding the consumption of agricultural commodities abroad during periods of low prices by mutually agreed upon export programs.
- (5) Research into the consequences of pursuing a policy designed to shift human resources out of agricultural production and into non-farm pursuits.

There may be other lines of policy research that could be named which would prove more fruitful. If so, let them be named and work on them be started. These are made simply as suggestions, not as a delineation of the field.

Who will do this important research in agricultural policy? We can assume, I believe, that Harvard, Chicago, and Brookings will continue their work on policy questions and perhaps even expand it somewhat. But it is to the State Colleges of Agriculture that we must look for a greatly expanded research program that deals with agricultural policy and its consequences. In the last analysis we must pin our hopes for an expanded program of policy research on

the individual researchers in the State Colleges of Agriculture; it is there that the human resources are available with the training, interest, and *relative* freedom necessary for this type of work.

But just in case there are any Federal administrators at these meetings or one should happen to read this paper, I should like to suggest that they give more consideration to policy research in connection with the Research and Marketing Act. I recognize the problems involved in doing policy research in the Federal Government; we have discussed some of them in this paper. But a sympathetic administrator who appreciates what can and cannot be done in this field could, with the funds at his disposal, get some important research work done on the vital policy issues at stake.

DISCUSSION*

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Professor Cochrane has done an excellent job of presenting a case for expanding research in the field of public policy. In addition to making an appeal for more research in public policy he suggests a methodology that can be followed.

Research in public policy is defined as "*that analytical work concerned with tracing the consequences of pursuing a given policy.*" For this definition to be valid the assumption must be made that it is possible to isolate the different stimuli, and all the combinations of stimuli, that are created by public agencies in their pursuit of a given policy and to trace the economic consequences of a change in either an individual stimulus or any combination of stimuli. This is a worthy objective for research in public policy, but it is not easily attained. It is desirable as a goal which research workers should strive to attain but it should be pointed out that even with good research it is unlikely that we will be able to trace, in a purely objective fashion, the economic consequences of pursuing a given policy.

This statement is significant since an appeal is made by Professor Cochrane to avoid confusing informed opinion with research in public policy. The question that immediately presents itself is whether a sharp contrast between opinion writing and research in public policy exists. Results secured by either quantitative or qualitative research must be interpreted. The interpretation made will depend upon the assumptions used, and assumptions in the social sciences tend to be controversial in nature. Even though the research methodology used is excellent the research worker must use opinion. The value of the opinion frequently determines the quality of the research.

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To use a specific example; Hans Staehle in a study on "Relative Prices and Postwar Markets," *Quarterly Journal of Economics*, February, 1945, shows in a quantitative fashion that during 1933 and 1934 there was a change in consumer preference for beef in relation to pork. Staehle makes no effort to explain the reason for this rather large and abrupt shift in consumer preference. In tracing the economic consequences of certain types of public policies, research of this type would be extremely important, but the research worker would need to make the decision as to what was responsible for such a shift. Was the Corn-Hog program of the 1933 AAA and the emergency beef program conducted by the Federal Surplus Relief Corporation either wholly or partially responsible for this shift in consumer preference? If those programs were responsible, what proportion of this economic consequence was due to each stimulus? Unfortunately the social scientists have not been able to develop a methodology which will enable them to trace economic consequences in a purely objective fashion.

This is not to say that we cannot do valuable research in the field of public policy or that such research should not be purely objective whenever possible. Much more research needs to be done in the field of public policy. The Land-Grant Colleges should emphasize this type of research, but it must not be forgotten that research in this field usually is controversial, and if controversy is wholly avoided, not much can be accomplished.

Not all economists will agree with the suggestion that the Federal Government should conduct economic research that is primarily concerned with the measurement of economic phenomena. It is agreed that the federal agencies have performed a fine and valuable service in collecting, assembling, and refining statistical data. It also can be conceded that "this type of research activity avoids the nasty distribution implications of political significance so often associated with economic analysis and almost always associated with policy analysis." Why should research workers in the federal service be excused from doing research work that is controversial in nature? Research workers in the Federal Government service in some respects are in a much better position to do certain types of research in public policy than are personnel in the State Experiment Stations. If the federal government can be excused from doing this type of research, can administrators in certain Land-Grant Colleges be blamed for avoiding such research? I concur with Professor Cochrane's opinion that this type of research cannot be avoided by Land-Grant Colleges if they wish to be great and influential, but I also would add that it cannot justifiably be avoided by research workers in the Federal Service either.

There is no disagreement with the objective that research in public policy should emphasize the consequences of policy actions or with the methodology developed. It merely appears that the assumptions implied in outlining the procedural steps for a research project that stresses the consequences of action are difficult to grant in the present stage of development of research in the field of public policy. A few of these assumptions are: (1) That we can choose, isolate and control the different stimuli that are created by different types of public policy. (2) That we know and are able to define the economic situation or environment which is relevant to

the action introduced. (3) That we can trace and describe the sequences of events or interactions that flow from the introduction of an economic stimulus in the form of a government program. (4) That we can determine objectively who are affected by the economic stimulus, how they are affected and to what extent.

I am in almost complete agreement with the discussion of the Research and Marketing Act of 1946. If I add my observations to those of Professor Cochrane's, I must admit that research in the states conducted under this act is proceeding along traditional lines and that "research in public policy is playing no more important a role in State research programs under the New Act than it did before." This act offers an opportunity to do research work in public policy which may prove to be considerably more fruitful than much of our traditional research. Yet we are continuing to use these additional funds to do more research in fields for which other research funds are available. Research work in these fields is important, but it is not so important that all funds should be used for it and research in the field of public policy be excluded.

The individual researchers in the Land-Grant Colleges should make an appeal for using at least a portion of the funds available under Title I for doing research in public policy. Although research work in this field is controversial, I believe we can rely on objectivity, tact, good sense, and academic freedom to avoid any unusual difficulties.

STATISTICS AND RESEARCH IN THE FIELD OF PRICE ANALYSIS*

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1. *Development of Empirical Price Analysis*

THE use of statistics and research in the field of price analysis has become widespread over the past thirty years. Rapid progress has been made in the development of techniques. Yet several problems remain to be solved if dependable answers to economic questions are to be reached by this means. Before stating some of the objectives and problems of empirical price analysis, we might briefly review the historical developments in this field.

Cournot, in 1838, is credited as being one of the first to set down the "law of demand"—the consumption function—in precise language capable of statistical manipulation. "... the sales or the annual demand D is, for each article, a particular function $F(p)$ of the price p of such article. To know the form of this function would be to know what we call the *law of demand* or of *sales*." This concept was popularized by Alfred Marshall, and is known as the Cournot-Marshall law of demand.

Leon Walras in 1873 extended the static law of demand for a single commodity from dependence on its own price to dependence on prices of all commodities and services. Here the problem becomes one of mutual determination. The position of the demand curve for a given commodity will depend on the values assigned to the prices of the various other commodities and services. The Walrasian System expressing the law of demand may be inverted and expressed as the law of price. That is, the price of any given commodity may be expressed as a function of the quantities of all commodities and services produced or consumed.

Henry Moore beginning in 1914 pioneered in the use of time-series data to obtain statistical demand, price, and production functions for a number of commodities.¹ Shortly after, income was in-

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† Acknowledgment is made of useful suggestions and advice by colleagues in the Production and Marketing Administration and Bureau of Agricultural Economics, with particular indebtedness to Richard O. Been, B.A.E.

¹ *Economic Cycles: Their Law and Cause*, 1914; *Forecasting the Yield and Price of Cotton*, 1917.

roduced as a separate independent variable to help explain changes in demand and price. Henry Schultz credited Slutsky with this development. Moore's empirical work was followed in the 1920's and 1930's by a number of attempts to determine the demand function, the price function, and the production function for various commodities, using time-series data and least-square regression techniques. Henry Wallace, B. B. Smith, Haas, Ezekiel, L. H. Bean, Holbrook and Elmer Working, Henry Schultz, and several others were prominent in this field.

A landmark was reached in 1938 with the extensive studies of Henry Schultz published in his book *The Theory and Measurement of Demand*. Schultz explicitly introduced time as a variable in the demand function. He expressed the general dynamic law of demand for a given commodity or service as follows $q_1 = f(p_1, p_2, \dots, p_n, E, t)$, where q_1 represents the quantity of the commodity or service purchased or consumed, p_1, p_2, \dots, p_n represent prices of the various commodities and services available to consumers, E represents net or disposable income of the community, and t represents time. This "general law" is still in use although later workers have introduced joint relationships, have made combinations of terms—particularly of the price variables—have deflated value terms by an index of the general price level, and have made numerous other transformations of the data preliminary to analysis. The form of function to be fitted—linear, curvilinear, logarithmic, and so on—leaves room for considerable ingenuity and testing on the part of the analyst.

Frisch in his confluence analysis and use of bunch maps approaches the problem of estimation in a somewhat different way from that of most analysts.² Frisch is particularly concerned with the question of selecting relevant variables before estimating relationships. Stone has made extensive applications of this method in the analysis of market demand for several commodities.³

Four tacit assumptions appear to underlie the use of least-square, single-equation, regression techniques in estimating the demand function. (1) There is a routine in the demand behavior of human beings in the market. (2) Statistical data of consumption, prices, and income reflect this routine of demand. (3) The unknown theo-

² *Statistical Confluence Analysis by Means of Complete Regression Systems*, Ragnar Frisch, Oslo, 1934.

³ "The Analysis of Market Demand," Richard Stone, *Jour. Royal Stat. Soc.*, Vol. CVIII, Parts III-IV, 1945

retical demand function can be approximated by various empirical curves which can be fitted to the observed data. (4) The routine of human behavior may change over time, but slowly, so that the demand function when approximated may be used for predicting future behavior at least for a short time. Similar assumptions appear to underlie the procedures followed in fitting price-quantity curves using concurrent data, and supply curves using lagged data as suggested by the cobweb theorem.⁴

Attempts were made by Pigou⁵ and later by Marschak⁶ to measure the price elasticity of demand by use of budgetary data. Those attempts, although viewed as successful by their authors, yielded income elasticities rather than price elasticities of demand. The budgetary method of analysis, as it has been used, shows a cross section in time of expenditures and consumption by income classes with little or no price variation. Nevertheless, budgetary studies, as conducted both in this country and abroad, have given fruitful results. Agricultural economists have been impressed by the fact that family expenditures for food tend to increase sharply from the very low income classes to the next, and tend to level off above the middle income groups. This finding has useful implications when we are dealing with national nutritional problems or with problems of agricultural surpluses. In connection with these same problems there is still a need for information on price elasticities of demand by income classes. It is presumed that prices have more influence on consumption, particularly for necessary foods, in the lower income groups than in the upper. But practically nothing is known of the relative influence of price on consumption in the different income groups. Repeated budgetary surveys of identical families, under variable price conditions, appear to offer the most promising means of obtaining such information.

Other approaches to the problem of empirical price analysis in recent years include the use of cyclical patterns, and the method of simple historical comparison to predict future price fluctuations. It is known that major cyclical peaks in prices are induced by wars,

⁴ "The Cobweb Theorem," Mordecai Ezekiel, *Quar Jour. Econ.* LII, Feb. 1938, See Also Henry Schultz, 76-79.

⁵ "A Method of Determining the Numerical Value of Elasticities of Demand," A. C. Pigou, *Econ Jour.*, XX, 1910.

⁶ *Elastizität der Nachfrage* ("Beiträge zur ökonomischen Theorie," No. 2) Jacob Marschak, Tübingen 1931.—Cited by Henry Schultz in *The Theory and Measurement of Demand*, 1938.

and hence are roughly predictable to the extent that wars are predictable. But the less spectacular cycles of interwar periods are distinctly lacking in regularity. Even the well-known hog production and price cycles can be easily upset by variations in weather or by changes in the general demand situation. Price predictions based on the repetition of cyclical patterns, involve the assumption of a rhythmic interaction between changes in production and prices. The more complex interrelations of economic forces, and unforeseen changes of a non-economic character such as severe and widespread droughts, are largely ignored. Nor has the invention of long-term, middle-term, and short-term cycles occurring singly and in conjunction, served to explain commodity price fluctuations convincingly.

The method of historical comparison to predict price variations is in fairly wide usage. Many economists consciously or subconsciously tend to compare events in a current period with events in some previous period when the surrounding circumstances were similar. This method of comparison involves the use of judgment and is largely intuitive. The results are surprisingly accurate at times. Nevertheless, the method lacks scientific basis, and is valuable chiefly as a stop-gap until more reliable methods of analysis are developed.

A serious attempt is being made by the Cowles Commission to develop structural systems of equations whereby, with the use of time-series data, it would be possible to determine the parameters of all important economic forces in the structures. Structural systems are not entirely new. The demand equation developed by Walras was essentially a structural system in that it involved the prices of all commodities and services. Others to suggest structural systems include Lenotief⁷ and Tinbergen.⁸ The structural systems and estimating methods being developed by the Cowles Commission were suggested by Haavelmo in 1943.⁹ These systems are novel in that random shifts are assumed for each of the equations, and in that all the equations are assumed to be mutually dependent, requiring simultaneous solution. These assumptions rule out the

⁷ *The Structure of American Economy, 1919-1929*, Wassily W. Leontief, Harvard University Press, 1941

⁸ *Statistical Testing of Business Cycle Theories*, J. Tinbergen, in two parts, League of Nations, Geneva, 1939.

⁹ "The Statistical Implications of a System of Simultaneous Economic Equations," Trygve Haavelmo, *Econometrica*, Jan. 1943.

possibility of using least-square, single-equation regression techniques. A new method of statistical estimation, using time-series data, was developed, largely by Haavelmo, Koopmans, Anderson, Rubin, and Girschick.¹⁰ The structural system, according to its authors, is designed to explain the structure of the economic system as it exists, and to give the "true" coefficients of elasticity, having in mind that most if not all of the economic forces at work are interdependent in nature. Prediction is achieved, in this system in the sense that if one or more of the economic variables is fixed or controlled, the effect of such action on all the parameters of the system can be calculated; that is, the change in the whole economic structure can be foretold.

2. Objectives of Price Analysis

Prediction is used in science in two ways: first to test hypotheses; second to apply accepted hypotheses or theories to specific situations for specific answers. These procedures can be illustrated in countless ways in the natural sciences.

In the field of price analysis our first objective is, or should be, the formulation of hypotheses which are capable of proof or disproof by the use of empirical data. Too frequently in economic theory the hypotheses are expressed in such general, abstract, or complex terms that it is impossible to devise empirical tests for them. Fortunately there appears to be a growing tendency to express economic theories in terms that may be reduced to manageable statistical forms. This tendency certainly should be encouraged. Otherwise, our tests of economic theory remain perpetually in the realm of logical reasoning and polemics.

With economic theory as it now exists, it is possible to employ statistics and research to obtain specific answers to many specific questions that arise in agriculture and industry. A basic objective of price analysis is to derive knowledge about economic relationships that will be useful in current problems of planning and prediction. To obtain this knowledge we need to make accurate statis-

¹⁰ Haavelmo, previous citation; also, "The Probabilty Approach in Economics," Supplement to *Econometrica*, Vol 12, 1944; "Statistical Estimation of Simultaneous Economic Relations," Tjalling Koopmans, *Jour. Am. Stat. Assn.*, Dec 1945, "Estimation of the Parameters of a Single Stochastic Difference Equation in a Complete System," T. W. Anderson and H. Rubin, announced for publication in *The Annals of Mathematical Statistics*; "Statistical Analysis of the Demand for Food: Examples of Simultaneous Estimation of Structural Equations," T. Haavelmo and M. A. Girschick, *Econometrica*, Apr 1947.

tical analyses of the production, price, and consumption functions with allowance for the interrelations among commodities and the effects of substitution. We also need other kinds of information. We need to study price margins and costs in processing and distributing agricultural products. We need to know more than we do about the structure of prices both in space and time. Important work can be done in studying geographical price relationships and the influence of such relationships on market movements. We also need to know more about the timing of price changes in relation to inventories and sales at different levels of the marketing system. With better understanding of such relationships, and more and better published information available, it might be possible for businessmen to avoid some of the wide speculative swings in prices that are characteristic of certain commodities. And for some commodities at least, intensive study is needed with regard to the problem of spreading the market price risk through widening the extent of ownership either of the physically stored commodity or through the holding of futures contracts.

Special problems and questions of policy frequently arise which require analytical solution. The imposition of a processing tax, for example, tends to increase the total marketing charge. It is important to know on whom the burden will fall most heavily, the producer or the consumer. The same problem, in reverse, is involved when the question of subsidies to processors arises. Other changes in marketing charges, such as increased transportation rates, may be analyzed by known techniques provided reliable supply and demand curves can be derived from the historical data at hand. Similarly, it is possible to measure the incidence of a tariff or of an import quota on domestic and foreign prices. It is also possible to evaluate the influence of changes in foreign supply or demand on domestic prices of an export commodity by use of statistics and research.

3. Current Problems in Price Analysis

Attempts to obtain solutions for such problems are constantly being made by the price analyst. However, there are certain obstacles to the complete and satisfactory fulfillment of the analyst's objectives. These obstacles may be listed under four headings, which are given here in order of increasing importance.

First, there is the problem of obtaining adequate statistical data.

Despite the mass of statistics already available, practically every price analyst has been confronted with the lack of sufficient or reliable data to make a complete analysis. For example, the measurement of price elasticity of demand by family-income levels is virtually impossible at present because of lack of family-expenditure data taken on a comparable basis over a period of time and under variable price conditions. Detailed analyses of marketing margins and of market price structures, commodity by commodity, are extremely difficult because of the paucity of representative and accurate data on prices, inventories, and sales at each of the stages in the marketing system. And frequently there is an unfilled need for representative price information by specified descriptions of the commodity such as grade, size and origin.

Basic data are the foundation stones of research programs in prices and related fields. Dependence on time-series data mean that in many cases acceptable analysis must await data accumulation over a period of many years. For this reason, the early stages of most long-range research programs should be given over to the problem of primary-data requirements, and where adequate data are not available, immediate steps should be taken to provide for their collection.

Second, in any study involving price interrelationships the analyst is confronted with the problem of intercorrelation among variables. A system as complex as the Walrasian or that of Henry Schultz in its general form probably is statistically indeterminate because of the large amount of intercorrelation present. Fortunately, statistical devices such as combining price terms and deflating price, cost, and value terms permit the research worker to handle such problems without great loss of precision. This type of solution is not always applicable, however, and the research worker must always be on guard to detect spurious results arising from intercorrelations among the various series of data. Frisch has considered this problem in detail in his work on confluence analysis. In the usual type of analysis intercorrelation may result in serious loss in the meaning of the coefficients of error, leading to misinterpretation of the results.

Third, and perhaps a more fundamental difficulty, is the problem of independence of successive observations within individual time series. The enthusiasm with which price analysis was conducted during the 1920's and early 1930's waned rapidly when many of the

predictions proved to be far wrong; and when, in addition, the importance of error probabilities began to be generally recognized. Although some confidence has been regained in statistical research with recognition of the expected degree of accuracy, there is still a serious question as to how far the price analyst can go in producing dependable results. Serial correlation is considered by some analysts to be important only if it shows up in the final residuals. Others regard it as a serious obstacle if it occurs in the primary data. More work needs to be done to demonstrate which of these two views is correct. If it is the latter, we may apply Bartels' criterion for measuring the independence of data.¹¹ Some applications of Bartels' criterion have shown that for certain agricultural price and production series an average of 3 or 4 years of data may be necessary to yield a single independent observation. Suppose, we have a multiple correlation problem with 4 variables and 21 years of data. Usually with linear equations we would consider that we had 17 degrees of freedom. However, if on testing each of the time series for independence of data we found it necessary to combine every 3 observations to give the equivalent of one independent observation, the total number of independent observations would be reduced to 7, and the total degrees of freedom would be 3. This may explain why so many of our correlations, which appear to meet the usual tests of significance, prove to be undependable for prediction purposes. And if the problem is difficult for single-equation systems of 3 to 5 variables, it is almost hopeless of solution in structural systems employing 10 to 20 variables unless we can obtain economic time-series data covering many more years of observation than are normally available.

If these first three problems could be solved successfully, we could obtain good measures of interrelationships and elasticities. However, if we are concerned with price prediction, in time, we are confronted with a fourth difficulty in the field of commodity price analysis. This difficulty arises from the fact that no one as yet has put forward a completely trustworthy theory of changes in

¹¹ Bartels' criterion requires comparison of twice the variance of the observed time series with the variance of the first differences. If the series were random the ratio would be approximately one. A larger ratio indicates serial correlation, and the value of the ratio—2, 3, and so on—indicates the approximate number of observations equivalent to one degree of freedom.—Attributed to J. Bartels, a German Meteorologist. For an interesting discussion of other aspects of serial correlation see also M. S. Bartlett, "Some Aspects of Time-Correlation Problem in Regard to Tests of Significance," *Jour. Roy. Stat. Soc.*, Vol. 98, III, 1935.

the general price level. It is possible, within the limitations just mentioned, to explain prices of individual commodities and services in terms of the general price level, or in terms of the national income which varies in large part with changes in the general price level. But in making a prediction of a future price for a single commodity or group of commodities the analyst is forced to make an assumption as to the probable level of the general demand factor used. Obviously the price prediction is no better than the assumption made. Moreover, if we add up the results of all individual price analyses made with reference to an assumed position of the general price level we will find that we have explained price in terms of itself. Many economists have wrestled with the problem of explaining variations in the general price level and related cycles in business activity. As perhaps the number one problem in the field of price analysis, intensified effort should be made to solve it both by the theorist and the price analyst using statistical research methods.

In conclusion, it might be argued that the obstacles to statistical price analysis are so severe that little reliance should be placed on this type of activity. However, I do not think this to be the case. It is true that we are on dead center so far as some of the problems are concerned, particularly with reference to making accurate predictions of prices in the future. But if the next thirty years should prove as fruitful of results as the past thirty, we shall have gone a long way toward overcoming the obstacles that now seem important.

DISCUSSION*

HARLOW W. HALVORSON
University of Wisconsin

I had expected that Mr. Walsh would approach this discussion on a somewhat broader basis. His discussion has centered primarily on the problems involved in the usual sort of aggregative analysis of agricultural prices—and I think he has done a good job of summarizing the statistical problems in this field. This is, indeed, a very important part of price research.

But I feel sure that another aspect of price research should be given increasing attention—namely that of concentrating further work on narrower segments of the field and of developing some of the sorts of research mentioned by Nichols in his recent article on "Marketing and Price Re-

* A discussion at the Annual Meeting of the American Farm Economic Association, Green Lake, Wisconsin, September 16, 1948.

search" in the *Journal of Farm Economics*. For various reasons I believe substantial results will be achieved by focusing much more attention on these sorts of studies. Effective use of market research funds requires better coordination of marketing and price research. It is true that many of the techniques mentioned by Walsh can be applied in this direction. In addition, it is probable that techniques of experimental design developed by our friends in agronomy and psychology will find a useful role in analyzing some of these problems. Furthermore, the testing of recently developed economic hypotheses in this field should offer fruitful possibilities and lead to further elaboration of theory.

I mention this point to dispel the impression that developed in my mind that statistics and price research would not do more than just continue the same sort of aggregative studies on which, except for minor reference, Walsh concentrated his attention.

A comment of similar nature might be made about the useful role the field of sampling theory can play in analyzing price problems.

In terms of its significance as a factor in explaining the fluctuations in most farm prices the importance of price level movements has long been recognized. Walsh does well in emphasizing the need for techniques and theory to forecast better the movements of price levels. Perhaps coordination of economic theory with other disciplines will help us move forward on this front.

Lack of adequate statistical data has always been an important limiting factor in price research. Data collected for other purposes probably will never be completely satisfactory raw material for price research, and judicious interpretation of results of price analyses will always bear this in mind. Consequently the emphasis given by Walsh to data-needs in long-range research programs as well as elsewhere is well taken.

I am somewhat concerned over Walsh's point that theory should be simplified so that it may be tested statistically. While much theory may be overly complex, it is true that simple continuous relationships are not characteristic of modern economic life. It seems to me that this is less a need than for developing better statistical techniques which are more flexible and which can better test more complex but more realistic theories. This, it seems to me, is one of the important contributions of Haavelmo and the Cowles Commission.

Having been a member of the B.A. E., I am somewhat surprised that Mr. Walsh has failed to pay his respects to the graphic correlation procedures which played such a large part in Bureau price research. Certainly from the standpoint of rough and preliminary investigations of price relationships this process has been a most valuable statistical tool.

One of the major limitations in statistical interpretation of economic relationships lies in the failure of the human universe to stay put—plus the fact that this universe is a complex one composed of widely different classes of elements. Tests of significance may be more accurately evaluated by considerations of serial correlation, but this seems to me to be essentially a negative approach to the problem. But I can't say that I can see a good alternative to it.

Another limitation has to do with the varying time lags by which people respond to the repetition of a given stimulus. Another has to do with the measurement of expectations. These sorts of considerations require careful interpretation of the data.

Allied with this matter of the failure of relationships to remain constant for long is the important problem of somehow recognizing as early as possible when these changes are developing. When does a given deviation from an average relationship represent (a) error in data, (b) random fluctuation, or (c) the beginning of a changing relationship? Looking backward in time, an answer to this question may in some cases seem obvious. But foresight is a different matter. The sharpening of our statistical tools and collection of more accurate and appropriate data should go a long way in calling the turn much sooner than we have been able to in the past.

TEACHING METHODS

Chairman: O. R. Johnson, University of Missouri

COORDINATING FUNCTIONAL AND DESCRIPTIVE MATERIAL IN TEACHING MARKETING*

AUBREY J. BROWN

University of Kentucky

ANY study of teaching methods for the general course in Agricultural Marketing must logically start with the objectives of such a course in the curriculum. It is to be expected that the objectives for this course are more nearly alike in the various universities and colleges than are the teaching methods used in meeting the objectives.

The objectives of the general marketing course are conditioned by several considerations. Whether or not the course is required of all agricultural students has a direct bearing on its aims. Also important are the number and scope of economic courses prerequisite to the general course, and in this respect considerable variation exists among universities. Of 31 states reporting on a questionnaire¹ prepared for this session, 19 states required economic prerequisites and 12 did not. Five of the 19 states specifying prerequisites indicated a requirement of 3 semester hours in economics, 8 states required more than 5, and the average for the 19 was 5.7 semester hours. Another factor influencing objectives is the number and scope of allied courses in marketing and prices in the curriculum. Rather wide variations in this factor likely prevail among the states. Also of some probable influence on the objectives is the variation among states as to the occupations chosen by agricultural students after graduation. While these factors are of influence on the objectives of the course, several also have a direct bearing on teaching methods.

It is likely that only a minority of agricultural students taking the general marketing courses also take other marketing courses. If that is correct, the knowledge gained by the majority of the students about agricultural marketing is received from the subject matter in the general course. Most students entering this course in

* A paper given at the Annual Meeting of the American Farm Economic Association, Green Lake, Wisconsin, September 16, 1948.

¹ Prepared and summarized by O. R. Johnson, University of Missouri.

the junior or senior year have had little systematic understanding of marketing, and further, their course work has been weighted heavily by study in the production courses. It would seem to me that under these conditions the basic course in marketing should be directed primarily toward subject matter of value to the general run of the students, and the course should stand more or less independent of the rest of the marketing curriculum. If adjustments have to be made to avoid too much duplication, let them occur in the other courses in marketing and prices

What then should be the objective of the general marketing course?² My answer is rather broad—to provide students with an understanding of the importance, significance, and operation of the economic system that transfers farm products into commodities available for purchase by consumers.

Should we strive to attain these aims through the primarily descriptive or the primarily analytical method? The answer to this question is far from simple, for many factors need to be weighed. Certain rather constant conditions prevail at most universities. Important among this group that have a bearing upon the answer to the question are the following: (1) students in the general course are mostly from farms and their background has afforded them little economic training; (2) the interest of the agricultural student is in the practical application of economics, and (3) the diversity of economic principles in marketing adds difficulty to analytical study of the subject matter. Certain variable conditions also influence the decision as to teaching this course at the different universities. Among these are: (1) the previous economic study of the student when entering the marketing course; (2) the policy of departmental unity; and (3) the status of marketing research at the given university. The question is therefore not solely "Which is the better method?" but it is also "Which is best adapted to the conditions prevailing at the particular university?"

To attain the stated objective no one of the so-called approaches can be used alone. The commodity approach, mostly descriptive, integrates the system and can well be used for several important farm products of the state to illustrate the related aspects of market-

² Attention is called to the papers on the general theme of Teaching Agricultural Marketing given at the joint session of the American Farm Economic Association and the National Association of Marketing Officials, December, 1931. These papers are published in the *Proceedings of the National Association of Marketing Officials on Marketing in Practice, in Research, in Training*.

ing. In our course we consider livestock, tobacco, grains, and milk and milk products. We usually precede this part of the course with brief discussions of economic geography and the demand for and the supply of farm products. One major difficulty in using the commodity approach early in the course is the lack of understanding by the students of many of the marketing terms used in the textual material. This part of the course, using the commodity approach, can become repetitious unless watched carefully. Essentially what we try to do is to enumerate the characteristics of the commodity as a base and develop the flow of the commodity through the markets, giving some attention to types of buyers and sellers involved. Emphasis is given to the basic differences in the marketing systems for the several products and the causes of those differences.

Once the student has gained some understanding of the integration of the systems for each of several major products, we move on to the functional approach. Such a method of study provides a simple means of breaking down a complex subject and permits application of economic principles to the development of the subject matter. Certain shortcomings of this approach are realized—most of the illustrative textual material is for the grains or fruits and vegetables, certain of the functions are hard to separate (perhaps they should be handled together), and it is difficult to make this approach as interesting as is desired.

There remain certain important phases of agricultural marketing in a general course that can be given more emphasis if they are handled outside either the commodity or functional approach. Study of costs and efficiency in marketing, cooperative marketing, and prices related to marketing are in this category.

Certainly the first named is one of the most important contributions of the course, remembering that most students likely will not take other marketing courses. Study of efficiency in organization provides concreteness to the course that helps to balance the great amount of description in other parts of the course.

How far to go in the study of cooperative marketing, or agricultural cooperation in the broader sense, in the general marketing course likely varies widely from state to state. In certain sections of the United States where cooperative development has lagged, the importance of an objective survey of this aspect of marketing cannot be passed over lightly in the required general marketing course.

. In the study of prices, the geography of prices, and day-to-day changes in prices, fit well in the general marketing course. Study of seasonal patterns of prices for a few major products of the state also emphasizes the importance of timing the marketing of these products from the farm.

The course sketched above is not in any sense suggested as a model. It was presented to indicate how the different approaches to marketing can be coordinated and how we have tried to arrange our course to meet the named objectives. Certainly the dangers in handling the course in this way should be pointed out. Most serious is the difficulty of coordinating the different aspects of the course so as to avoid confusing the students. Another danger is the presentation of too much material, reducing the effectiveness of the assignments and discouraging some of the students. We try to gauge how well the students are assimilating the material by giving short weekly examinations and by occasional class discussion.

Handling the subject matter in this manner gives the students a broad understanding of marketing of agricultural products usable in farming or in other occupations related to agriculture. This type of a course also provides a base for the following marketing courses where the problem method is better adapted and where the student has the background to handle the analytical method of teaching satisfactorily.

THE PLACE OF LECTURES, RECITATIONS AND LABORATORY WORK IN PRESENTING SUBJECT MATTER IN INTRODUCTORY MARKETING*

BEN F. ALVORD

Alabama Polytechnic Institute

IF REPLIES to Prof O. R. Johnson's questionnaire index accurately the time allotted to lectures in introductory courses, in Marketing, then about half of the time is so used.

The introductory course usually aims to acquaint the student with the general marketing principles, functions, and procedures applying to principal farm products. These are usually described in more or less standardized ways in various text books. The order of description and the approach may vary somewhat, but they usually sift out finally in rather standardized form. It is vitally important that the beginning student understand these principles, functions, and procedures. However, students do not usually find them particularly difficult to understand and the situation does not tend to seriously challenge the ability of the instructor in presentation of his material. Thus, the situation smoothes the road for a dry lecture essentially repeating the text—presented materials. If this occurs, one might expect that the mentally inert student will not awaken, that the prepared student will note the repetition and turn his attention elsewhere, while the alert unprepared student may jot down key points which will give him at least a pass without having read the text and worse, perhaps without bothering to seriously question what the course is about. In my opinion the situation is more likely to occur in a beginning marketing course than in other agricultural economic courses where the lecture method is used.

The remedies that instructors use appear to be many. Concrete illustrations that touch the experience of the members of the class are brought in, personal experience of class members are solicited; hypothetical cases are set up to fit the current topic; problems are evolved for class solution, informal discussion periods are inserted, and various other means are employed. Perhaps 50 per cent or even more of the class time can be devoted to lectures. The lecture certainly enables one instructor to reach, at least after a fashion, a

* A paper given at the Annual Meeting of the American Farm Economic Association, Green Lake, Wisconsin, September 16, 1948.

large number of students with minimum expenditure of time and money, but this dry method to be reasonably effective, must be "moistened" frequently with well chosen breaks from text book material such as are mentioned above. In my opinion the lecture can bring very good returns per dollar expended but those returns depend very much on good management of the lecture.

Recitations or discussions appear to occupy less than half of the classroom time, according to Prof. Johnson's survey. The purposes of "recitations" are many, but at least 3 seem worthy of special note. The first is to be sure the student is so well drilled that he can hand back in tests what the text and the instructor presented him. Perhaps this purpose is worthy when uniformity is essential, such as, when problems are to be worked and specific types of illustrative figures are to be presented. But in general this purpose as such is more fitted to grade and high school days than to college. A second purpose may be to "sample" the class to see if they understand the material being covered. "Recitations" for this purpose undoubtedly have a valuable place, but the time consumed should be held to the minimum required to fulfill the purpose. Finally, recitations may make or "drive" home points. These may be built on leading questions and realistic illustrations. For this purpose wise choice of questions and choice of students to which questions are put are essential to economy of time in making the points. However, assuming the points are difficult and the questions and students are wisely chosen, this procedure may be used very effectively. Other purposes of recitations include interest promotion, tying the student more closely into the course, and encouragement of real contributions on the part of the student to the course.

The results of Prof. Johnson's survey indicate that teachers of marketing usually use some so-called "laboratory" work to aid them in "putting across" their material.

This laboratory work usually takes one or more of 3 forms. About thirty percent scheduled regular laboratory periods varying from 1 to 3 hours. The nature of the work in these periods was unspecified. About the same number use one or more field trips as part or all of their laboratory work. About three-fourths require from one to 12 or more written reports as part or all of the laboratory work.

The variety in lecture, recitation, and laboratory requirements undoubtedly reflects largely three important variables, namely, the specific functions of the marketing course offered, the availability

of laboratory material, and the varying personalities of instructors.

Some beginning courses serve to briefly introduce marketing and are consistently followed by other courses in marketing. Some individual beginning courses are made up as more or less "complete presentations of the marketing subject." In such instances the subject matter is heavy and credit assigned is relatively large. Some introductory courses are developed without prerequisites of any kind and some are offered only to students who have had one or more economic courses. Some may deal largely with crops because other supplemental courses cover livestock and livestock products. Some may deal largely with livestock, while supplemental courses cover crops. All of these variations lead to variability in treatment.

Then, too, some colleges are located in great market centers where opportunities for educational field trips to wholesalers, manufacturers, buyers, etc. are numerous and travel costs are low. Others are in relatively isolated areas and offer little opportunity to observe without considerable expense anything except the relatively simple country market.

Finally, instructors gradually build their marketing courses around their own personalities, experiences and "biases."

In my opinion, rigid standardization of procedure and hours in lecture, in recitation, discussion and in laboratory is an impossibility so far as beginning marketing is concerned. There must always be something that is continually being "cut and tried" in the course or it may become very soon a "cut and dried" course presenting certain valuable principles but being woefully weak on inspiration.

UTILIZATION OF ILLUSTRATIVE MATERIAL, FIELD TRIPS AND OTHER AIDS IN TEACHING MARKETING*

C. G. McBRIDE
Ohio State University

BEFORE discussing the problem of teaching aids to which I have been assigned, it may be well to state briefly what we have as objectives for our marketing courses. Our students come to these courses with a background of ten quarter hours of general economics and five quarter hours of agricultural economics. We assume that they have the economic principles underlying the marketing of farm products fairly well in mind.

We aim to introduce them to the various agencies concerned in the functions of marketing farm products and purchasing farm supplies. We believe that good illustrative material is as essential in a marketing course as in any of the production courses.

One of our first moves is to try to put the student into a sort of atmosphere or environment of marketing. We require that he subscribe for a trade paper. For the general course in marketing farm products, most of our students choose the *Chicago Drovers Journal* but it may be one of the *Packers* or any other good market paper. Once a week we devote a full class period to the current market news. We try to create in the student the same sort of interest in daily market news that he might have in the comics, sports, or politics. We believe that to create such a reading habit market news must have continuous attention throughout the entire course. Each student is required to chart from week to week the price of one or more agricultural commodities.

Another exercise designed to demand careful reading is the collection of advertisements designed to illustrate both the sale and the purchase of farm products and farm supplies individually and through cooperatives.

We have a requirement that where a course is open to both undergraduates and graduates, the graduate student is assigned extra work. This may turn out to be an opportunity for a demonstration by the graduate of some phase of his research. A good example was a study of pre-packaging fruits and vegetables in which the

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student showed a film of store pictures and brought to the class several actual examples of pre-packaged vegetables.

With us the field trip has top rating, and it appears to enjoy the same high favor from students. While the trade paper helps to put the student into an "atmosphere of marketing," the field trip if well organized teaches him to "know his way around" among marketing agencies.

To reach its highest value there must be (1) a preview in the class room to give students some idea of what they are supposed to see, (2) an itinerary carefully prepared in advance giving exact addresses of places to be visited and names of persons who will receive the class on the visit, (3) close and courteous attention of the students at all times, (4) a comprehensive and detailed report from each student, including observations en route. This report receives heavy weighting in making up the course grades.

Our field trip for the general course in farm marketing has been run into Chicago with but one or two exceptions. Buses are generally used although we have at times used the railroad, private cars, and last year we had a bus and two U-drive-it cars. We leave Columbus, Sunday morning, spend all of Monday and until about 2:00 P.M. Tuesday in the markets arriving in Columbus around midnight on Tuesday.

In my opinion it is important to emphasize the personnel as well as the physical side of the places visited. The mimeographed itinerary carries the full name of every person we expect to meet. The students are expected in the trip report to evaluate these people as well as the marketing operations. My Chicago trip comes in the fall, and each person who helped in our visits not only receives a letter of thanks from our office a few days after the trip but at Christmas time he gets a greeting on a special Christmas letterhead signed by all members of the class.

Field trips for the single commodity marketing course in fruits and vegetables, livestock and dairy products are taken to cities other than Chicago. The class in fruit and vegetable marketing this year went to New York City and Washington. In the dairy marketing course the trip is confined to markets within the state.

These trips are required of all students. In order to obtain tax exemption on transportation a laboratory fee is collected at the beginning of the quarter by the bursar and we cover travel and hotel

bills by requisition. Last year this fee was not allowed as college expense for students under the G. I. Bill.

It has been our practice to make limited use of persons outside to the university staff for lectures. Until recently we had each year someone from the Chicago Board of Trade. Other organizations that have cooperated with us have been the Ohio Farm Bureau Cooperative Association, The American Dairy Association, The Ohio Retail Merchants Association, The Ohio Guernsey Breeders Association, The Ohio Livestock Producers Association.

Our decision with respect to the use of any of the aids discussed above is based upon our feeling as to their value in bringing vitality into the course. In most cases these aids do not make teaching easier. Often as in the case of field trips they involve a great amount of extra work. If, however, they bring what we are trying to teach into sharper focus they are worth while. When busy men from outside are brought in to meet a class, it is as important that they feel it has been worth while as that the students feel so.

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MR. HOOVER'S DEPARTMENT OF AGRICULTURE*

LAUREN SOTH

Des Moines Register and Tribune

IT would be hard to find a human institution so inviting to the efficiency engineer as the United States Department of Agriculture. One can imagine an organization-chart expert rubbing his hands with anticipatory pleasure as he studies the maze of bureaus, services and agencies which make up USDA today. Almost any logical reshuffling is likely to look better than the present tangle.

Our efficiency expert soon finds, once he digs into the thing, however, that it is very difficult to separate organization, as such, from fundamental policies of government. He finds that organization for production of government services in agriculture is quite different from, say, organization for production of automobiles. If he were working out an organization plan for the General Motors Corporation he would be interested, presumably, in only one end: minimum cost of producing cars. He would not be tempted to question whether something else should be produced. But in dealing with USDA, or any other government organization, it is virtually impossible to forget ends and deal only with means.

The Hoover Commission on Organization of the Executive

* This article was reviewed by.

Fred A. Clarenbach, associate professor of political science, University of Wisconsin.

Carl Hamilton, editor of the Iowa Falls Citizen and former assistant administrator of the Rural Electrification Administration.

O. B. Jesness, professor of agricultural economics, University of Minnesota.

Walter W. Wilcox, professor of agricultural economics, University of Wisconsin.

Most of their comments are shown here as footnotes, but I have changed some wording in the text as a result of their suggestions, for which I wish to express my appreciation.

Branch of the Government, in most of its reports, seems to have stuck closely to its organizational knitting. But at a few points—notably on the question of public power development—it has had trouble keeping its members' policy preconceptions from affecting recommendations on structure of the government.

In its report on Agriculture, the Commission evidently tries to avoid changing the character of the services which the Department now performs. But the "task force" which did the spade work for the Commission did not. It had a point of view about the kinds of programs the Department should be conducting, and it took no pains to divorce this view from its organizational plan. Although the Commission itself deleted some of the task force recommendations, the final report still reflects a definite "slant" on agricultural policy in general.

This is inevitable, of course. The writer is not deploring it but simply pointing out that the Hoover plan should not be considered as relating to administration alone. It is also a policy document.

I

The Hoover Commission's plan calls for re-grouping the agencies and bureaus of the Department along functional lines. The purpose (says the Commission) is to "secure more concentration in the responsibility of direction, elimination of overlap, conflict and waste, and further, to make possible the realization of broad policies in the Department." The resulting structure, the Commission believes is "sufficiently flexible to permit programs and activities to be added or dropped without requiring major reorganization."

Under the Hoover plan all the Department's activities would be grouped into seven major administrations, or "services," as it calls them. To help in the guidance of these agencies, the Secretary would have a unit of staff services, with an administrative assistant secretary in charge. These staff services are finance, personnel, management research (continuing studies of economies in operation of the Department), legal counsel, supply, publications, information and library.

Instead of the 20-odd agencies which now report to the Secretary, there would be only seven services—Research, Extension, Agricultural Resources Conservation, Commodity Adjustment, Regulatory, Agricultural Credit, and Rural Electrification. Separate congressional authorities to subordinates in the Department (such

as the Governor of the Farm Credit Administration) would be eliminated.¹

This sort of re-grouping and fixing of responsibility certainly looks like good sense; it should streamline administration of the Department, make for more unified policies, less red tape and greater efficiency. Many critics of the "loose confederation of independent bureaus and agencies" which is now USDA should be pleased with the Hoover plan

* * *

Besides re-grouping the agencies of the present Department, the Commission proposes to move into USDA the land management functions of the Department of Interior (except "mineral questions," National park, Indian, and other special purpose lands). This is something every Secretary of Agriculture has wanted to do and every Secretary of Interior has resisted. Henry A. Wallace and Harold Ickes especially used to quarrel over it.

Both the natural resources and agriculture task forces of the Hoover Commission agreed that the Forest Service, the Bureau of Land Management and the public land functions of the Soil Conservation Service should be consolidated. The only argument was about which department they should be in. The natural resources study group argued for Interior, on grounds that it already has similar functions in the National Park Service, the Fish and Wildlife Service, and the Bureau of Reclamation. The agriculture group favored Agriculture, largely because it felt public land management policy should be consistent with *total* national land policy on privately-owned lands.

Since the Fish and Wildlife Service manages some public lands, the agriculture task force wanted to move it into Agriculture, too.

The Commission ruled in favor of the view of the agriculture task force on public land management, except that it left the Fish and Wildlife Service in Interior.

This consolidation, if approved by Congress and the Adminis-

¹ Comment by Fred A. Clarenbach: The Commission in its *General Management* report strongly recommended that the department head be given authority "to determine the organization within his department" and "to assign funds appropriated by Congress for a given purpose to that agency in his department which he believes can best effect the will of Congress." The Commission envisages real departmental control by the Secretary, one foundation for secretarial authority and discipline being (ordinarily) the power of appointment of chiefs of services and bureaus. These recommendations are of high significance for agricultural policy co-ordination and efficient administration.

tration, ought to result in genuine economies in reduction of overhead, lower administrative costs and in reduction of field offices. It is difficult to see how any logical objection could be made to this unification of public land agencies.

II

In drawing up a chart of Departmental functions, the Commission naturally had to arrive at some arbitrary judgments about classifying present agencies—and about splitting agencies which have more than one function. This was easy for such bureaus as those managing public lands. They obviously fall neatly into the proposed Agricultural Resources Conservation Service.

But where do you classify the Farmers' Home Administration, for example? Is it farm credit alone—or is it extension? Or does it include something entirely different from either of these broad classifications?

The task force decided that FHA is primarily a farm credit agency and placed it into a new Agricultural Credit Service, along with the present Farm Credit Administration and the Rural Electrification Administration.

The Hoover Commission decided not to go along with the task force on REA. In the final report it recommended a separate Rural Electrification Service which would be the same REA under a new name. It apparently was convinced that REA has enough important non-credit functions to justify its autonomy as a separate agency outside the catch-all farm credit organization.

But it backed up the task force on FHA, leaving this agency in the Agricultural Credit Service.

On the surface it appears that FHA would be able to continue operations about as it does now. But the intent of the task force is quite clearly the opposite. It expects a saving of \$35,000,000 a year in FHA lending as a result of the reorganization. This must mean a much "tougher" lending policy.

The frequent, gratuitous references of the task force to the need for restricting such loans to "especially qualified" borrowers also indicate where the wind is blowing from.

Nothing in the task force report would indicate that this group recognizes the close supervision of loans and farm family education as an important part of FHA activities. There is more than a little basis for the suspicion that the task force would like to play down

the rehabilitation features of FHA and absorb this agency into the credit machinery for the larger commercial farmers.

This would be not mere reorganization for *efficiency* but reorganization to *eliminate* what has come to be an important function of the USDA—the rehabilitation of low-income farmers through an intimate educational approach, associated directly with the provision of credit. This is what comes of following to extremes the principle of functional organization.^{2,3}

It also illustrates how the task force's conceptions of agricultural policy influenced its organizational plan. Putting FHA into an overall credit agency probably would prevent its ever becoming an effective adjustment agency to rehabilitate Southern agriculture and to expedite a shift from cotton and tobacco to livestock.

The Department of Agriculture's numerous programs of crop adjustment, conservation payments, price supports and education (Extension) have all notoriously benefited the top 50 percent of the farmers who produce 90 percent of our agricultural products. The amount of attention devoted to the lower half of agriculture is illustrated by the size of FHA's budget as compared to the budgets of the rest of the Department.⁴

If the Hoover Commission proposals are carried out, the underprivileged in agriculture will be left by the wayside even more than they have been in the past. One cannot conclude that the effect of this change in the status of FHA escaped the attention of the task force simply because it was engrossed in getting a neat pattern of functional units. The explanation must be that the bias of this committee is the same as the bias which has "set the pace" in our agricultural policies over the last 15 years.

² Comment by O. B. Jesness: Some persons fear, on the other hand, that putting the two types of operations (co-operative credit and direct lending) in the same administrative agency will weaken the operations of the agencies which are on a *commercial* basis and tend to bring *them* into the subsidized category. This might be the outcome, but I see no real reason why the man in charge of such a combined administration should not be able to keep the two types of activity separate. This difficulty should not be any greater than that of the Secretary in the event that two separate agencies report to him directly.

³ Comment by F. A. C.: The intent of the task force on FHA policies seems clear; but simply to place FHA in a Credit Service would not make the adoption of such policies inevitable.

⁴ Comment by O. B. J.: If the Department is viewed as an agency dealing primarily with agriculture, rather than with people on the land, then its concentration on the problems of farmers, rather than of people who happen to be living on the land, has considerable justification. Though the Department may have the most effective machinery for reaching people on the land, certain types of public aid may appropriately fall within the scope of other public agencies.

It may be an over-simplification to say the task force represented the Farm Bureau-Extension point of view, but it certainly is fair to say that the proposed action on FHA is not inconsistent with that point of view.

III

In the field of soil, water and forest conservation, the Hoover Commission recommends setting up an omnibus action agency called the Agricultural Resources Conservation Service. It would administer all conservation programs, manage the forests and grazing lands, be responsible for soil surveys and land classifications, and represent the Department in water resources surveys, flood control programs and reclamation projects.⁵

This new Service would carry on all the work now done by the Agricultural Conservation branch of the Production and Marketing Administration, the Soil Conservation Service, the Forest Service, and the Bureau of Land Management of the Interior Department—except that all research activities of these bureaus would go to the new Research Service.

All technical conservation services to farmers would be administered by the Extension Service. The task force report says that the Resources Administration will “see to it that adequate technical service and needed assistance in conservation practices are available through the Extension Service of USDA and the Extension Services of the respective states to soil conservation districts and other organizations and farmers.”

This sounds as though all the conservation technicians of SCS would become employees of the Federal and State Extension Services. However, in the table showing transfer of employees, the task force shows these technicians as moving into the Resources Conservation Service. In the text of the report the task force says that the Extension Service would be “strengthened by additions to the . . . force of specialists and technicians who now operate in the field independently of the State Extension Services”

So it is not completely clear who would hire and fire the technicians, but it is perfectly clear that the *intent is for Extension to*

⁵ Comment by F. A. C.: The reports do not indicate how USDA programs are to be co-ordinated with TVA or other river basin or regional organizations. The conflict in the Tennessee Valley over soil conservation districts might largely disappear under the new plan—but the much broader problem of co-ordinating other overlapping USDA and TVA programs meets only silence.

administer the work. It may be fairly said that the task force has adopted the views of the Farm Bureau on this point, also.

The report says a "strong central administration" will carry its educational and service program to soil conservation districts through a "revitalized" Extension Service. But it seems to this writer that some confusion and division of authority still would prevail under this plan.⁶

Neither in this part of the report, nor anywhere else, do the task force or the Commission pay heed to the close affiliation of the Farm Bureau and the Extension Service in a number of states. The "revitalized" Extension Service is supposed to take over all the information and education work of the department, *including technical services to farmers*. It is to be noted that compliance for conservation payments would also be certified by technicians responsible to Extension. Is this good public administration to permit one major farm organization to have a strong voice in determining which farmers get services and payments?

A committee of the Land Grant Colleges and the Department of Agriculture recently reported that this was *not* sound public administration—even for "pure" educational activities. It is interesting to note that the one dissenter on this committee was Dean H. P. Rusk, of Illinois, who served as chairman of the Hoover task force for agriculture.⁷

The task force not only ignores the Extension-Farm Bureau tie-up, it also seems to be unconcerned about the cherished educational freedom of the Land Grant Colleges—their independence from USDA action programs. It assigns Extension an important role in *all* action programs. It recognizes that agencies responsible for "compliance with rules and regulations by citizens who participate in or receive benefits from" their programs must have authority to

⁶ Comment by Walter W. Wilcox: The recommendations on Extension-Agricultural Resources Conservation Service relations are fuzzy, certainly. I doubt that we can ever appropriate enough money to get an adequate job of conservation done as long as everyone waits for Uncle Sam to do it. The Commission missed a golden opportunity to recommend policies which would force state and local groups to assume more responsibility in conservation, perhaps through some form of grants-in-aid.

⁷ Comment by W. W. W.: The seeming Farm Bureau bias may result from independent farm leaders holding the same views on certain issues. But the omission of any discussion of Extension-Farm Bureau relationships is a major gap in what purports to be a comprehensive set of recommendations. The marital relations of these groups may not be as iniquitous as currently supposed, yet few familiar with congressional opinion on this topic expect Extension to be given important new duties until the marriage is annulled.

publish facts about these programs and interpret them to farmers. But it says Extension is responsible for "extending this information in appropriate ways."

With all the difficulties that arose during the AAA period (when Extension was supposed to handle the educational work for crop adjustment programs) fresh in their minds, it is amazing that this task force could now blandly propose the same thing over again in connection with conservation services and payments to farmers. The only recognition that any problem exists in this area is this statement from the task force report:

"However, when a Land Grant College is unable or unwilling to co-operate in any given project, and the Secretary believes the public interest or the law requires, the project will be carried direct to the farmer by the (Federal) Extension Service or other appropriate agency of the Department."

Most people undoubtedly want their Land Grant Colleges to be free to criticize Department programs and policies. This plan of organization certainly points in the opposite direction. The Extension services in the states cannot be a "service agency for all other Administrations in the Department" and still be free to conduct unbiased educational programs.

IV

For the important jobs of commodity price supports, loans, crop insurance, and crop adjustment programs, the Hoover Commission proposes a new Commodity Adjustment Service. This Service, as recommended by the task force, would be the present PMA, minus its regulatory and market news functions (which go into a new Regulatory Service) and plus the Commodity Credit Corporation and the Federal Crop Insurance Corporation. The Commodity Adjustment Services would be organized into commodity bureaus, except for CCC and FCIC.

The individual commodity bureaus would handle all price support programs, procurement of supplies for foreign relief, etc. CCC, which has in the past administered some of these programs, would only be a service agency for financing the programs.

This implies an organization of adjustment programs similar to that of early AAA days. One would expect, if this is true, that the same sort of conflicts between bureaus representing dairymen and and feed producers, Cotton and Corn Belts, and Wheat and Corn

Belts would develop again. It sounds like the type of organization which T. W. Schultz has criticized as the "department of separate commodities." The Commission's recommendations seem to give little weight to the importance of approaching adjustment problems from the standpoint of the farm business as a whole.

Other than this, there would be no important change in top organization so far as the functions of this Service are concerned.

* * *

However, the Commission recommended two important changes in accounting and budgeting for price support and other programs. It would remove the borrowing authority from CCC, giving it a revolving fund of three billion dollars, from which funds for approved programs would be drawn. Congress in the future would make one appropriation for restoring impairment of capital of CCC and another for administrative expenses of the Corporation.

Another change would remove the authority of the Department of Agriculture to use 30 percent of certain customs receipts for price support. "The earmarking . . . of funds for special purposes has elements of waste, since it cannot be predicted that in any particular year use of all of such funds . . . will be necessary."

* * *

The big change in commodity adjustment programs would be in the field organization. The Commission has recommended a sweeping overhaul of all field services at state, county and farmer levels.

All actual administrative work in the field by all Department agencies—including that now done by county AAA committees—would be performed by regular Department employees. The report recommends, however, that the Department make as effective use as possible of state departments of agriculture on a co-operative basis. In each county, Department of Agriculture Councils, comprising representatives of the different Departmental services, would be organized to exchange information on their programs. "Services at county levels and to farmer units should be so merged as to reduce the number of duplicating and unnecessary employees. . . . Regular field personnel should be jointly housed, wherever practicable."

In addition, the Commission proposes state and county agricultural councils to serve in an advisory capacity on Department pro-

grams. This portion of the plan looks much like the councils suggested in the Aiken bill introduced in the Senate a year ago.

The state council, according to the task force report, would be made up of four ex-officio members: the state secretary of agriculture, the Extension director, the Experiment station director and the head of the state Conservation department. Eight farmer members would be elected by the county agricultural councils.

The county agricultural council would be made up of farmers elected by farm owners and tenants of local administrative units within the county.

These councils would replace all present federal agricultural committees and boards, including the AAA committees, the FHA advisory committees, and so on. They would perform only advisory duties and would be paid only out-of-pocket expenses. They would review and consider all Department programs but would not have a "veto power."⁸

Whether these changes in the field organization would bring about greater unification, less duplication and more local control by farmers could be learned only by actually trying them out. The confusion which exists in many agricultural counties today is ample reason for trying out a new system, and the proposals of the Commission on this score probably will receive considerable support. However, both the soil district commissioners and the AAA committeemen, who have developed highly effective organizations, may be counted upon to resist any attempt to absorb them into a general advisory council.⁹

So far as administration goes, it must be granted that the AAA part-time committees have done a good job. But they have shown tendencies at times to operate like a farm pressure group—most recently in promotion of 90 percent of parity fixed supports in opposition to the sliding scale supports of the 1948 farm price act. The general farm organizations feel that political activity of this

⁸ Comment by W. W. W. The task force recommendations on field organization may slightly increase co-ordination and integration at the local level—but to expect a locally-elected group of farmers, acting in an advisory capacity, to effectively co-ordinate the work of several different Federal employees hired, fired and directed by different bureaus in Washington is unrealistic.

⁹ Comment by F. A. C. The reports do not make clear what relations between the county agricultural council and the supervisors (commissioners) of the soil conservation districts are contemplated. It seems likely that, with the proposed general advisory council and a different administrative setup for resources conservation, the soil conservation districts would tend to atrophy.

kind is *their* business—and not that of people charged with responsibility of carrying out a government program. By putting all administration in the hands of Department employees and setting up broad advisory councils of farmers this danger of “agency pressure groups” may be avoided.¹⁰

V

One glaring gap in the task force recommendations is the failure to consider the possible need for food distribution programs on the order of the food stamp plan or the Aiken food allotment plan. The only mention of anything of the kind is of school lunches, and the recommendation in that case is to move the program to the Federal Security Agency.

While the purpose of the school lunch program is primarily social welfare, the purchasing of food would be done by the Department of Agriculture in any case. In a severe business recession, we are almost certainly going to carry on food distribution programs on a large scale—not as a welfare measure alone but also as a means of supporting farmers' incomes. This is strictly USDA business. It is directly related to other farm programs, crop adjustment especially. It would seem wise to this writer to prepare for such programs in the Department of Agriculture. An organizational framework should be ready, and experimental programs should be underway now—so that the worst blunders could be avoided if and when the time came for large scale action.¹¹

But the Hoover Commission and its task force either (1) ignore

¹⁰ Comment by Carl Hamilton: The Hoover report recommends abolition of the AAA farmer-committee set-up. Soth commends the committees for their good job but, recognizing their “tendencies to operate like a farm pressure group,” appears to “go along” with the Hoover recommendation. There are two things to be thought about here. Although it may be wrong in theory, strong agencies of government have always developed ways and means of making their thinking known and felt. The U. S. Forest Service is one of the best organized, most efficient agencies in the federal government. Yet few groups, either in or out of government, can surpass it in ability to accomplish legislative objectives. But it does not operate in the Farm Bureau's field—which makes a lot of difference.

Furthermore, the clamor in this day of big government is for decentralization. The Hoover report itself cries out for more of it. Yet here in the AAA committees we have one of the first serious attempts to place administration in the hands of farmers themselves and—because the farmers show tendencies of operating like every other government agency—we would junk them at the first opportunity.

¹¹ Comment by O. B. J.: I am less certain that food distribution is a function of USDA. Soth seems to regard food distribution as a matter of surplus disposal. I lean in favor of food distribution guided by dietary considerations and see considerable merit in having them administered outside USDA.

the possibility of such programs, (2) prefer that even large scale food distribution be handled by another department, or (3) prefer crop restriction, foreign "dumping" or other income-support measures to domestic food subsidies.

There are some good reasons why separation of consumer and producer interests is desirable in the Federal government. But the task force was not concerned with this problem in its recommendation that all food and drug inspection and regulation be in the Department of Agriculture. So here again the failure of the task force to provide for an organization oriented to probable future agricultural problems indicates a bias and a particular point of view on general farm policy.

VI

On the whole, the Hoover Commission's reorganization plan appears to promise some real gains in orderly administration and efficiency. It would establish a chain of command and neat functional compartments worthy of military organization.

But it is this very rigid adherence to a functional concept that leads into some blind alleys.¹²

In some of the new Services there would be little chance for effective *combination of functions* where needed. The Farmers Home Administration is one example. The unified administration of the Soil Conservation Service is another. It would be a miracle of cooperation if the Farm Credit Administration and the Extension Service could work together to accomplish the same fusion of education and credit that FHA has achieved. It would be even more miraculous if two agencies, Extension and the proposed Resources Administration, could do as good a job of helping farmers develop conservation plans as SCS has done by itself.

Thus in splitting some programs up into their functions, the Commission plan might contribute to inefficiency rather than efficiency.

¹² Comment by C. H.: A neat organizational chart is of much less significance than a clear recognition of the various fundamental jobs that must be carried out by the USDA and its close associates, the Land Grant Colleges. Crises will come and go, and new action agencies will be added and eventually amalgamated in the Department. Time will look after those problems. But until organization specialists can approach their assignment in the Department with clear realization of the paramount importance of distinguishing (and separating) "research," "education" and "action" nothing really fundamental can be accomplished. Apparently the Hoover group did not make that distinction.

MEASUREMENT OF AGRICULTURAL PRODUCTION

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Bureau of Agricultural Economics

THE measurement of agricultural production was one of the original activities of the Department of Agriculture when it was organized in 1862. This statistical service was begun after several decades of earnest discussion and promotion by leading farmers, agricultural societies, and the farm press for unbiased information on major crops during the growing season, harvested production, and numbers of livestock on farms. These farmers wanted protection from the effect of false and misleading reports emanating from those who wished to buy their products at low prices. The published series of agricultural production for the nation and by states began with the year 1866—82 years ago.

Scope of Published Statistics Concerning Agricultural Production

At the present time the Bureau of Agricultural Economics publishes throughout the year statistical reports giving current national and state estimates of production, stocks and prices received by farmers for more than 150 farm products. These reports include estimates of acres of various crops the farmer intends to plant (March), acres planted for harvest (July) and acres harvested (December). During the growing season monthly forecasts of production are made on the basis of reported crop conditions on the first of the month. Conditions of pasture or range are reported monthly by states. Production is estimated for 136 crops, including fruits, nuts, vegetables, and field crops.

Statistics concerning livestock and poultry production include annual estimates of numbers and classes of livestock and poultry on farms January 1, and annual estimates of calf and lamb crops and chickens and turkeys raised. Estimates of hogs raised are made twice a year, in June for the "spring" pig crop (December 1 to June 1) and in December for the "fall" pig crop (June 1 to December 1). The volume of milk and eggs produced is estimated monthly, and that of wool and mohair annually. The number of chicks hatched is estimated monthly. A complete enumeration is made

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each year of the factory output of about 45 different kinds of dairy products. Monthly and weekly estimates are made currently for the more important dairy products.

Forecasts and estimates of agricultural production are made for the nation and for each of the 48 states. County estimates for a few major products are published annually in nearly all states, and for most of the important products in 16 states. In 12 of these, county estimates are based on an annual Assessors' state farm census of crop acreages. The Federal Census provides county statistics in considerable detail for all states at 5-year intervals.

Except for a few minor agricultural products the present program of the Bureau provides current measures of agricultural production. Two fields that are only partially covered are market-garden vegetables grown adjacent to metropolitan areas and bush fruit crops. A start is now being made for the New York City area where more than 50 different vegetable crops produced locally are sold in the New York City market. A beginning has also been made in the Boston area. These beginnings were made possible by the designation of RMA and state funds for a complete census of market-garden crops in these two areas.

These measures of production are not the only estimates prepared by the Bureau of Agricultural Economics. Such subjects as crop utilization, farm employment, wage rates, farm accidents, and price indexes are outside the scope of this paper although they would certainly be listed in any catalogue of Bureau subject matter.

Timeliness of Agricultural Production Statistics

Current series relating to agricultural production for the United States and for each of the 48 states—intentions to produce, prospective production, and estimates of production—must be *timely* to be of maximum value. For example, the monthly crop reports relating to conditions as of the first of the month are issued between the 8th and the 10th of the current month, the twice-a-year reports of hog production (The Pig Crop Reports) are issued within 18 to 20 days of the end of the 6-month period covered by the report. Somewhat more time (about 6 weeks) is allowed for the December report of harvested acreages and production of all crops. For more than 80 years the public has been accustomed to this kind of "timetable."

In the case of quick-growing vegetable crops, the need for timely

information is so great that monthly reports are supplemented by a semi-monthly publication called the "Truck Crop News." This publication carries pertinent and timely information as to the progress of the various commercial vegetable crops in competing states or areas. Conditions referred to are as of the first and fifteenth of each month, and the release is made on or about the 6th and the 20th. Release is simultaneous from the field and Washington offices and previous review of the state material in Washington is not required. Each field-office release carries information on crops in competing states, whereas the Washington release is a national summary.

Measures of anticipated, current, and realized agricultural production are of five general types:

(1) *Intentions* to produce the principal spring-sown crops are estimated in March, based on farmers' reports of acreage intended to be planted to the different crops. Intention reports are obtained in June and December for fall and spring farrowings (pigs), in January for turkeys raised, and in February for chickens raised.

(2) *Forecasts* of yield per acre and/or production are made monthly during the growing season for each crop, based on farmers' reported condition of the crop in percentage of a "normal" or "full" crop on the 1st of the month, and on estimates of crop acreages made July 1 for spring-sown crops and December 1 for winter wheat and rye.

(3) *Current estimates* of yield per acre and/or production are made at completion of harvest. Revised estimates of acreage, yield, and production of all crops are made the middle of December each year.

(4) *Revised estimates* are made after the close of the marketing season and, except for cotton, tobacco, peanuts, sugar beets, and sugarcane, are not published until the following December crop report.

Revised estimates for cotton, tobacco, sugar beets, and sugarcane are published in May, and peanut revisions are published in July. These revised estimates for all crops are made ex post facto, or historically. They are based primarily on commercial marketings, shipments, volume processed or handled, and other commercial or PMA data that are available and reasonably complete, and on the Annual Assessors' State Farm Census in the few states in which an historical enumeration of acreage or production is made. These

commercial check data include cotton ginnings, peanut shellings, tobacco sales, reports from sugar manufacturing companies, fruits and vegetables canned and processed, carlot shipments of fruits, vegetables, livestock and grain, records on numbers of livestock assessed for taxation, market receipts of livestock and other agricultural products, quantities of certain agricultural products processed for sale, plant production of manufactured dairy products, and state inspection records of livestock movements, slaughter, and inventory counts.

(5) *Final revised estimates* are made every 5 years after Federal Census data become available. This revision involves the *level* of the annual estimates for the last 5 years. Federal Census data are adjusted for incompleteness and also to get back to a January 1 basis in the case of livestock inventories. The adjusted Census data are then relied on rather heavily in the case of those agricultural products for which commercial check and other information is inadequate or not available. Examples are agricultural products that are largely consumed on the farm or shipped primarily by truck rather than by rail.

Intentions, forecasts, and current estimates are based almost entirely on returns from voluntary mail sampling, interpreted by means of regression, that is, the historical relationship of the revised or final revised estimates to the sample averages and ratios. In a few important states in which the Assessors' State Farm Census is taken in the spring and relates to the acreage of crops planted, or to be planted, a sample of these data by townships is used in estimating crop acreages for harvest on July 1, and in the fall a mail survey of farmers reporting on the spring State Farm Census is used to bring crop acreages planted, or intentions to plant, to an acreage-harvested basis.

Methods of Sampling

A—VOLUNTARY MAIL SAMPLING: Two types of observations are used with mail questionnaires, (a) judgment-for-the-locality observations for condition of the growing crop and pasture expressed as a percentage of a "normal" or "full" crop, probable yield, and harvested yield per acre, and (b) individual-farm observations for crop acreages, numbers of livestock, farm stocks, utilization of livestock, and acreage-and-production to obtain a derived yield per acre after harvest. The individual-farm observation relates to the

reporter's own farm, whereas the judgment-for-the-locality observation relates to the farms in the locality where the reporter lives.

Voluntary mail samples fall into four general categories, the first three of which are as follows:

(1) *Regular monthly reporters* receive a general crop and livestock questionnaire the first of each month. Items on these monthly questionnaires are predominantly judgment-for-the-locality type of questions on crop and pasture conditions, yields per acre, etc., but they also include individual-farm observations on the rate of milk and egg production, farm stocks quarterly, farm employment and wage rates, etc. This regular monthly reporter list of about 80,000 farmers returns on the average about 24,000 questionnaires, or 30 percent.

(2) *Individual-farm reporters* receive crop-acreage questionnaires in March on intentions to plant, in June on crop acreages for harvest, and in the late fall on acreage and production. In January they receive a livestock disposition questionnaire. These questionnaires are sent to about 320,000 farmers. On the average, about 80,000 usable schedules are returned, or 25 percent. In many states the regular monthly reporters are also included in making these individual-farm inquiries.

(3) *The rural mail carriers* of the Post Office Department distribute about 600,000, unaddressed individual-farm cards to farmers along their routes three times each year—in June and December on livestock and in October on crop acreages harvested. About 160,000 cards or 27 percent are returned and tabulated.

The voluntary mail samples described above are what might be called "general-purpose" samples. The questionnaires used include a considerable number of the more generally grown agricultural products and they are sent to a general list of farmers in all agricultural counties in each State. In addition, "*special-purpose*" mail sampling is used in forecasting and estimating acreage, condition, yield and/or production of important commercial crops and classes of livestock for which an adequate sample cannot be obtained by general-purpose sampling. Examples are commercial fruit, nut, and vegetable crops; such field crops as tobacco, dry beans, broomcorn, sugar beets, sugarcane, and seed crops; cattle and lambs on feed, sheep, cattle, and goats on ranches, wool and mohair produced, turkeys, broilers, non-federally inspected slaughter, grain stocks in mills and elevators, chicks hatched, and, in a few states, monthly

egg and milk production. Mailing lists of these special producers and processors are maintained in the Agricultural Estimates Field Offices.

Population characteristics of agricultural producers that require "special-purpose" sampling may be summarized as follows.

(1) The populations are small in size compared with all agricultural producers in a state; consequently, the frequency of occurrence is low.

(2) The production is usually geographically concentrated in one or a few areas because of special soil, marketing and especially climatic requirements of these agricultural products.

(3) Some of these agricultural specialties have a sporadic distribution in space, and a few are sporadic in both space and time; for instance, in-and-out cattle and lamb feeders, producers of certain commercial vegetable crops in some states, and producers of such seed crops as clover and bluegrass.

(4) A relatively small proportion of the larger growers usually produce a high proportion of the total production. For example, in New England less than 10 percent of the farms on which chickens are raised produce more than 70 percent of the eggs.

Geographic stratification and weighting are used with the voluntary mail samples. A typical state is divided into nine "crop-reporting districts" and weights are based on data from the last available Census, Federal or State. These crop-reporting districts are delineated in a more or less arbitrary manner with about an equal number of counties in each district. In a few states, consideration has been given to type-of-farming areas in making this stratification. But as one system of stratification is used at present for practically all agricultural products, probably little would be gained from a more refined method of geographic stratification.

Research is now under way to determine the statistical efficiency of the present method of stratification, and whether a somewhat different stratification might not be used to advantage with different important agricultural products in some states. In a few states an additional stratum of "large farms" (1,000 acres and over) superimposed on geographic stratification has served to increase the stability of acreage ratios obtained from voluntary individual-farm mail samples.

B—FIELD OBSERVATIONS AND PERSONAL CONTACTS WITH COMMERCIAL PRODUCERS. BAE statisticians make general field observa-

tions of crops during the growing season and have personal contacts with well-informed growers, livestock producers, and other "key" people who buy or handle farm products, or extend credit to farmers. These personal contacts are practically indispensable with the agricultural products which require "special-purpose" sampling; in evaluating the damage done to crops by hurricanes, freezes, floods, hailstorms, or droughts; and in estimating cattle and sheep on feed.

C—OBJECTIVE PLANT COUNTS AND MEASUREMENTS: Objective plant counts and measurements are made with certain important commercial and feed crops in the fields in which these crops are growing. Objective sampling methods are used in selecting the fields to be sampled and in selecting the small "sample areas" for harvest. These methods have been used with wheat, corn, cotton, potatoes, peanuts, and soybeans. For citrus fruits "frame counts" are made in California and Florida in selected groves to determine the number of fruits on trees in comparison with previous years. Diameters of representative fruits also are measured to obtain an index of size. The crop meter, which is attached to the speedometer cable of an automobile, has been used to measure the crop frontages along selected routes each year to provide an indication of acreage change in various crops from year to year in certain areas of the country where this technique is practicable.

D—PRE-SELECTED INTERVIEW SAMPLING: In recent years interview area sampling has been successfully used to a limited extent in making estimates of certain kinds of agricultural phenomena for which voluntary mail sampling is not especially appropriate. Examples are family and hired labor employed on farms, farm wages, farm accidents, farm income and expenses, farm machinery, and farm practices, including the use of credit, fertilizer, and various marketing channels.

A 15,000 farm nation-wide farm-interview survey was made in January 1947, a 12,000 farm sample in April 1948, and a 10,000 farm sample in September 1948. In the first two surveys, area segments were enumerated in more than 800 counties by about 450 local interviewers under the direct supervision of the agricultural statisticians in the 41 Agricultural Estimates Field Offices. Because of limited resources the October 1948 survey was confined to 400 counties and covered only farm employment and wages and farm

accidents. The other two surveys were made with a longer schedule which required on the average about one hour of interview time. Increasing operating costs make necessary proportionally increased appropriations if nation-wide interview surveys are to be continued.

Objective sampling of this kind makes it possible to obtain a representative cross-section sample of all kinds of farms and farm operators that can be expanded directly into an estimate, even without use of Census data for expansion. In the case of a good many agricultural phenomena voluntary mail sampling requires the use of regression methods of estimation using the average relationship between an historical series of revised estimates and the historical series of sample averages or ratios. The sampling error of estimates made from an objectively taken sample can be determined and frequency distributions and various cross-classifications can be constructed as well as aggregate estimates. With voluntary mail sampling, on the other hand, the sampling error cannot be measured by any statistical methods as yet developed and estimates can be made only in terms of totals and such averages as yield-per-acre, milk production per cow, or rate of lay per hen. Furthermore, a good deal more information can be obtained with an interview sample than with a mail sample. In general, a mail questionnaire must be kept short and simple or the returns will be very small and highly selective.

On the other hand, mail sampling, accompanied by regression estimating has certain advantages over interview sampling. It is much less expensive, and estimates can be made from a nation-wide mail sample in from 8 days to 6 weeks, whereas an interview sample requires several months, depending upon the length and complexity of the schedule and the adequacy of machine-tabulation facilities. With present resources, BAE is limited very largely to the use of mail sampling.

E—"SEMI-CONTROLLED" AND "CONTROLLED" MAIL SAMPLING. Selectivity in returns from mail sampling usually introduces bias in the final results unless some sort of control is exercised. "Semi-controlled" mail sampling differs from "uncontrolled" mail sampling in that the returns are stratified and weighted to minimize the effect of *differential response*. Differential response in a mail sample may be associated with one or more characteristics of the population sampled, such as age or education of the operator, type

of farm, size of farm, size of the individual farm enterprise (number of hogs, dairy cows, acres in a specified crop, etc.), capacity of a processing establishment or hatchery, etc. In addition to using such control information for stratifying and weighting the returns, we can go a step further and use the information to design the mailing list in such a way as to achieve a more nearly optimum allocation of returns from the various strata than would be obtained from an uncontrolled selection of names. Population characteristics used for these purposes must be known for the entire population, or at least for a representative cross-section of it, preferably for a recent date. If the information is to be used in designing the mailing list, it must also be available in advance of making the survey. The particular characteristics that are used as controls must be correlated with the items that are estimated from the sample if they are to be effective.

An Assessors' State Farm Census, an interview survey such as the ones made by BAE in January 1947 and April 1948, or similar sources of information may be used to provide the necessary control information. The "semi-controlled" mail sample is then obtained by circularizing all, or a properly designed sample, of the names so obtained. Returns are then stratified and weighted by one or more known characteristics of the population that are correlated with the items to be estimated. When that is done we have a "semi-controlled" mail sample, or one that is corrected at least in part for the selectivity that is inherent in a mail sample.

During the last 18 months, BAE has successfully experimented with "semi-controlled" mail sampling. For example, in June and July 1947 and again in January 1948, short schedules were mailed to the respondents of the January 1947 interview survey. Returns from two successive mailings were 70 percent in June, 60 percent in July, and 55 percent in January. These returns were much larger than those usually obtained in mail sampling. From the July survey an estimate was made for REA of the number of farms electrified and not electrified.

Complete control of a mail sample may be achieved by interviewing a properly designed sample of non-respondents to the mail survey. This procedure has been used only to a limited extent in our organization, but it shows considerable promise as a tool for detecting biases that may not be completely eliminated by the

"semi-controlled" process and for making necessary adjustments in mail returns. A "controlled" mail sample is actually a combination of mail and interview sampling.

"Controlled" mail sampling offers promising possibilities in connection with "special-purpose" sampling of small but commercially important agricultural populations or for the small strata of the large producers in such populations who account for a very large percentage of the total production. In fact, "controlled" mail sampling is now used to a limited extent by some of the BAE Field Offices.

Methods of Estimation

Forecasts and current estimates have been made by regression methods since about 1930 for practically all agricultural products except the fruit crops, and even there the regression method has been used for citrus and pecans. Relationships between the historical series of revised estimates of acreage, numbers of livestock, yields-per-acre, etc., and the historical series of crop-acreage ratios to land in farms, average number of each species of livestock per farm, yields-per-acre, etc., obtained from the voluntary mail samples described earlier in this paper, are shown on scatter diagrams. The "regression line" actually used is "fitted" by the statistician when he makes the forecast or current estimate by means of a hair line centered on a transparent ruler. In this way allowance may be made for trend, or change in the relationship over time, and greater weights may be given to previous seasons which seem to be most nearly comparable with the current season.

Unlike other crops, in forecasting the cotton crop the Board estimates production, and the yield per acre is derived by dividing the estimated production by the indicated acreage for harvest. Instead of estimating the yield per acre and multiplying this figure by the acreage for harvest to obtain production, it has been found that some precision is gained by correlating indexes of production with actual production. The index of production based on the reported condition is obtained by multiplying the condition times the weighted par yield (that is, the yield corresponding to 100 percent condition) times the current acreage for harvest. The production index for the reported yield per acre is simply the product of the reported yield and the current acreage for harvest. The level of both reported condition and the yield per acre tends to be a func-

tion of the acreage level, resulting in some gain in reliability of the estimates and considerable saving in time required in making the estimates.

Condition and probable yield of cotton as reported early in the season do not adequately take into account the level of boll-weevil damage. An index of loss caused by weevils, based on the reported weevil infestation, therefore is used as an additional variable in the forecasting procedure. Use of this second factor, which involves multiple correlation, results in a significant improvement in the accuracy of early season forecasts.

Beginning in October, about 50 percent of all ginners report the number of bales expected to be ginned after that date in addition to reporting the number of bales ginned to date. These data are used to calculate the percentage ginned to date. This figure is expanded to an estimate of production in two ways. In one procedure the derived percentage ginned is correlated with the actual percentage ginned to remove the bias. The estimated ginnings to date are then expanded to 100 percent using the correlated percentage ginned, the estimated bale weight, and the cross-state ginning correction. This index of production is charted against actual production. In the other procedure, the estimated ginnings to date are adjusted to 100 percent based on the ginners' percentage ginned as originally calculated, the reported bale weight, and the cross-state factor. The one regression of production on this index removes the bias. The latter procedure is proving to be the more satisfactory. As the ginning season progresses, more and more weight is given to ginners' indications in adopting production estimates.

In the winter wheat area of the southern Great Plains, precipitation during the autumn months is of vital importance in starting the new seedings. Therefore, charts of final yields against September–November precipitation are used in preparing the December forecasts of the following year's winter wheat yield. In each of the spring and early summer months until harvest, cumulative precipitation charts are used in much the same way. Similarly, April precipitation is used in May to forecast potato yields in Virginia. In a number of states in the northeastern fourth of the country final potato yields are highly correlated with pasture condition during the early part of the season; in those states, pasture condition is used as a separate indicator of prospective potato yields.

The interesting thing about all of these methods is that they rep-

resent departures from sole reliance upon reported condition and probable yield of the crop in forecasting production. In the case of many other crops, as has already been noted, processing or marketing data are considered *after harvest* has been completed in arriving at a final or revised estimate of production. Sometimes such data are used on an absolute basis, as in the case of cotton ginnings; sometimes when not all of the crop is accounted for, as is the case with truck crops, regression charts are used.

Research is being undertaken to determine whether a more objective method of fitting the regression line and allowing for trend and other factors would increase the accuracy of forecasts and current estimates; and also to determine whether, in addition, the regression of revised estimates on forecasts and current estimates of production would improve accuracy. Another research project has been planned to determine whether the accuracy of forecasts of yield-per-acre at harvest could be improved by using, for more crops than at present, other factors in addition to reported condition of the crop or probable yield per acre, such as weather factors that might reflect test weight in the case of small grains, shelling percentage and moisture content in the case of corn, or weight of the leaf in tobacco.

Considerable research was done during the late '20s and early '30's exploring the relationships that might exist between available weather factors before or during the growing season and harvested yield-per-acre of important crops. Use of precipitation data in forecasting yields of wheat and potatoes is a result of such research. It was found, however, that for most crops the appearance of a crop as reflected in the reported condition served as an "integrator" of previous weather effects and gave as high or higher correlations with harvested yields as did any of the combinations of weather factors to the date (the first of the month) when the condition of the crop was reported by crop correspondents.

However, further research is needed in approaching the problem from the standpoint of using appropriate weather and other factors in *combination* with the reported condition. Factors that might be considered are pre-planting-period rainfall, advancement of the crop, and rainfall during the last week or 10 days of the month. It is possible that the most recent weather has not been fully reflected in the appearance of a crop on the first of the month. Similar studies of weather effects might establish significant relationships with

yield for the first week in the month, thereby making it possible, although not necessarily desirable, to bring the forecast of crop production more nearly up to date when it is released on the 8th to the 10th of the month, whereas now the forecast relates to the condition of the crop as of the first of the month. If reliable weather forecasts for the remainder of the growing season were available, the accuracy of within-season forecasts of yield and production undoubtedly could be increased.

Research has already been undertaken for the purpose of making fuller use of "semi-controlled" mail sampling from the Assessors' State Farm Census data in some of the states in which these censuses are taken each year. For example, in Iowa estimates of the number of sows farrowing each month are being made experimentally with marked success. The questions are asked on the General Schedule, but control information for the farms involved comes from the Assessors' Census.

Since the late '20's "matched" or "identical" farm samples, that is, a comparison of current reports from the same farms from one year to the next, have been used as an additional indication of year-to-year changes in crop acreages and livestock numbers. A matched sample of this kind is essential in states where the number of "bona fide" farms is small or where the agriculture is extremely diverse and specialized, to provide some semblance of stability in the individual-farm samples of crop acreages and livestock numbers. Unfortunately, the smaller matched mail sample is often more selective of the more cooperative and progressive farm operators than is the larger unmatched mail sample, and it may be more biased on that account. It is doubtful whether a matched sample should be given much consideration when the sample returns are adequate to provide stability in crop acreage ratios to land in farms.

As suggested a moment ago, regression methods are not so widely used in the estimation of fruit crops as in the estimation of field crops. It is true that they are used regularly for citrus and pecans and experimentally for a number of other fruits. Frame counts are also used for citrus. For most other fruit crops, however, production is still estimated directly by the so-called "par" method, a variation of which was also used from 1912 through 1929 for field crops. As currently employed in the estimation of fruit production, the method consists essentially of the computation for each state of an assumed 100 percent or full production for a given year on the

basis of the relationships in recent years between estimated production and average reported production as a percentage of a full crop. The calculated full crop is called "par." Early in the season of the given year, the reported condition as a percentage of a full crop is converted to probable production as a percentage of a full crop by regression methods, and the resulting percentage production estimate is multiplied by the "par" to obtain an estimate of the probable size of the crop in absolute terms that is, in bushels, boxes, barrels, or tons. Similar procedures are run through each month until the last month of the season, when the reported production as a percentage of a full crop is applied directly to the "par."

Bias in Mail Samples

Mail samples are subject to an unknown degree of bias because of the selectivity in the returns received, and the fact that the mailing list, except in "semi-controlled" or "controlled" mail sampling, is ordinarily not a true cross-section of the population sampled. The population of farm operators may be thought of as forming a pyramid with the more cooperative and progressive farmers at the top. The mailing lists used in sampling are composed in large part of the farmers who do cooperate by returning mailed questionnaires, at least occasionally. The returns of a mail sample may be considered as coming from the top part of such a pyramid; these operators have larger farms and more livestock than the average farmer; they more readily adopt new farming practices and new crops, use improved varieties of seed and more fertilizer than the rank-and-file; and generally they are the farmers who also cooperate with the agricultural county agent.

From the standpoint of judgment-for-the-locality type of observation, farmers from the top of the pyramid are preferred, leading farmers who are acquainted with what is happening in their locality. However, in individual-farm sampling of crop acreages and livestock numbers a more nearly representative cross-section sample of farm operators is needed than can be obtained by uncontrolled mail sampling. The more progressive and cooperative farmers may not change their crop acreages or numbers of livestock at the same rate as the "rank-and-file." They may be more or less sensitive, to the impact of economic or natural forces that affect the profitableness of their operations.

To the extent that the bias of a mail sample remains constant,

the regression method of estimation has proved reasonably satisfactory, even with many of the minor crop and livestock items, as evidenced by a comparison of estimates with census enumerations. It is least satisfactory for new crops introduced in a state for which no adequate independent indications are available for use on a regression basis. Where new high yielding varieties are rapidly introduced or where fertilization or chemical weed control is used more generally to increase production, an additional variable must be introduced for forecasting yields.

The problem is this: in the early stages of the introduction of a new crop or farming practice, statisticians ordinarily can not know the extent, or perhaps even the direction of, the bias present in mail samples. Our theoretical model of what happens is something like this: "In the early stages a mail sample tends to overestimate the acceptance of the new crop or practice, and then after the farmers who inhabit the top of our pyramid have pretty generally adopted the improved crop or practice, the rank-and-file farmer becomes interested and 'follows suit.' Consequently, the mail sample shows little or no increase at a time when the rank-and-file farmers are increasing rapidly. This situation can be visualized by super-imposing a growth curve representing the acceptance of the new crop or practice by farmers who inhabit the top of our pyramid on another growth curve representing acceptance by the entire population. The first starts upward at an increasing rate while the second is getting slowly under-way; the first begins to level off while the second is increasing at a rapid rate."

Let me repeat, this is a theoretical model and although applicable in modified form to a good many situations, to many other situations it is completely inapplicable. Let us suppose that a new pasture or hay crop comes into an area because it does well on poor land. Lespedeza in Missouri is an actual example. Insofar as the farmers on the poor land may not be adequately represented in our voluntary mail sample, the increasing importance of the new crop is underestimated in our sample indications. Furthermore, it is very probable that the time-lag in adoption of new crops and practices by the "poorer" or less progressive farmers in a given area is much less than our theoretical model envisages. The tremendous reliance on the radio as a source of technical information has no doubt reduced the relative advantage enjoyed by the better-educated farmer who reads the experiment station bulletins

and utilizes the advisory service of the county agent. Furthermore, there is a growing practice among the seed companies to test their new varieties and hybrids in each area before making the seed available commercially in that area. This means that adequate supplies of seed become available to all would-be users much more nearly simultaneously than was the case when seed companies permitted their product to go into areas to which its adaptation had not been tested.

Obviously, our theoretical model is an over-simplification, the uncritical use of which would be dangerous. Under circumstances of rapid technological change such as we have just been describing, some independent and unbiased indication is absolutely necessary for the making of reliable estimates. In the dozen or so states in which we have state Assessors' Censuses, unbiased information as to acreage can be obtained, and in a few of them information as to production as well. In the great majority of states, however, no complete enumerations of any sort are made between quinquennial Censuses of Agriculture. Complete marketing or processing checks are possible with relatively few farm products. Having neither an Assessors' Census nor a complete production check, a state in which a new crop, variety, or practice is spreading must ordinarily resort to one of the four following techniques:

- (1) Pre-selected interview sampling,
- (2) Objective plant counts and measurements,
- (3) Controlled mail surveys,
- (4) Semi-controlled mail surveys.

The decision as to which of these to use depends upon availability of the representative lists necessary for controlled or semi-controlled mail surveys, funds available, and accuracy of information obtainable from individual producers. In ascending order of cost the methods are semi-controlled mail, controlled mail, pre-selected interview, and objective plant counts and measurements. The last method is ordinarily used where the individual farmer may not know the answers for his own farm. For example, in parts of the South where most of the corn is fed without being cribbed there is a widespread impression that most farmers never know how much corn they have produced, even at the end of the season. If this is true, even a complete census may give erroneous answers. The solution to this problem is an objective pre-harvest survey in

which a representative sample is laid out, and the corn from measured areas is harvested and weighed. Such a survey was made in Alabama during the recent autumn, and preliminary results indicate that the yield, as estimated from the General Schedule indications, is at approximately the right level.

Reliability of Forecasts and Current Estimates

A research project is under way in the BAE to evaluate the accuracy of forecasts and current estimates of agricultural production for the United States and by states for the purpose of determining, as well as available data will permit:

- (1) The level of accuracy of various forecasts and current estimates;
- (2) The increase in accuracy over time;
- (3) Any systematic error in the United States and state forecasts and current estimates;
- (4) The gain in accuracy in forecasting and estimating resulting from the use of current survey indications for the crop or livestock item in question, rather than merely carrying forward Federal Census data, the previous year's final estimate, or a trend computed from previous years' final estimates.

It is theoretically possible that in the case of very minor crops or livestock items in some states the use of current survey indications from "general-purpose" samples may not give any more accurate forecasts or estimates than the rough methods which would have to be resorted to if such survey data were not available. If that situation is discovered, a change in estimating methods will probably result, for the current expenditure of time and funds in the making of the survey will not be justified. Systematic errors at either the state or the United States level obviously would call for corrective action to minimize such errors in the future.

The methodology of the current appraisal is relatively simple. Forecasts and current estimates are compared with revised estimates made after the current year's production has been marketed or has become carry-over. The degree of independence in source data such as between current estimates and final revised estimates varies greatly among crop and livestock items. The greater the independence the more valid the appraisal of accuracy when forecasts and current estimates are compared with final revised esti-

mates. In the case of agricultural products that are consumed largely on farms and commercial agricultural products for which inadequate check data on shipments, marketings, or amounts processed are available, a comparison of forecasts and current estimates with final revised estimates will not be very meaningful, and, in fact, will amount to an appraisal of "internal consistency." All forecasts and current estimates are evaluated in comparison with the final revised estimates unless the use of the earlier revised estimates provides a more valid comparison of year-to-year change. The "departures" of forecasts or current estimates are expressed both in units of measure (bushels, bales, barrels, etc.) and as a percentage of the final revised estimate. Similar comparisons are made of the change from the previous year's revised estimate. A "direction score" is also calculated which measures success in forecasting the direction of change expressed on a scale from zero to 100 percent. This is the proportion of the forecasts or current estimates that were in the correct direction from one year to the next.

Whenever an appraisal of forecasts and estimates in major States and the United States for a significant number of crop and livestock items has been completed, the results will be made available in as intelligible form and widely circulated medium as possible.

DISCUSSION

CLIFFORD HILDRETH

I BELIEVE this paper is serving a useful purpose and I am glad to see the material presented. The principal suggestion I wish to make is that considerably more of such information is needed and should, I believe, be published regularly along with the various estimates that the Bureau of Agricultural Economics publishes.

In the early part of the paper it is pointed out that the production information services of the Department of Agriculture were initially undertaken to protect farmers from "false and misleading reports." Nothing further is said about the purposes served by such information. It seems to me that there are four principal groups vitally interested in the production information gathering services of the BAE. These are farmers, dealers and processors of agricultural products, action and legislative agencies of the government, and agricultural research workers. I am better acquainted with research workers than with the other groups so my suggestions are offered primarily with their needs in mind.

The worker who is basing research on production data always needs some indication of the reliability of the data. It would be a useful practice if these data were regularly accompanied by indications of reliability. If a particular estimate has been obtained by a sampling process, a standard error of estimate can be calculated. If a published estimate is based largely upon subjective judgments then a standard error in the usual statistical sense is ordinarily not possible. However, those persons who are able to exercise sound judgment in formulating an estimate should also have some judgments as to the reliability of the estimate and their judgments as to reliability would be of great help to the research worker. The Census Bureau has been furnishing estimated standard errors along with its estimates of various magnitudes for several years.

In addition to the data-gathering agency's own estimates of reliability the research worker should have ready access to a fairly complete description of the information gathering and estimation processes. This would serve two useful purposes—it would enable the research worker to form an independent judgment as to reliability of the data and it would enable him to offer suggestions for improvement in the processes.

To illustrate these notions I should like to mention several matters treated in the paper that I believe are of interest to research workers and on which I think the research worker needs considerably more information before he can form a judgment as to the desirability of the practices now being followed. This is not intended to mean that I believe the needed material should have been included in the present paper but is offered as a suggestion for supplementing the information given in the paper.

In comparing mail sampling to interview sampling the paper states that mail sampling is generally less expensive and yields results more quickly than interview sampling. I do not see why results cannot be obtained

¹ Morris H. Hansen and William N. Hurwitz, "The Problem of Non-Response in Sample Surveys." *Journal of the American Statistical Association*, v. 41, pp. 517-529

quickly when speed is an important consideration and when this is taken into account in the design of the survey. There are instances in which interviewing surveys have yielded results very quickly. It is true that interviewing surveys generally cost more than mail surveys; however it is possible that some relevant items in the cost comparison are sometimes overlooked. In a mail survey part of the cost to the public does not appear as a BAE expenditure but is borne through the postal deficit. Also extended use of interview surveying would generally improve the reliability of survey results and this should make possible some reductions in the costs of non-survey estimation activities. It is probable, however, that these adjustments still leave interviewing as the more expensive survey technique. The extra cost must be balanced against the additional information that can be obtained from an interview as compared to a mail questionnaire and the increased reliability of the results of a well-conducted interview survey.

The technique that was called controlled mail sampling in the paper may be the preferred alternative in many cases. It has been developed from a sound theoretical base by Hansen and Hurwitz who have provided methods for estimation of magnitudes, methods for estimation of error, and the principles to be considered in designing an efficient survey.¹ I know of no comparable work for semi-controlled mail sampling and am somewhat more doubtful regarding its general value. In particular its use seems to depend upon making corrections from regression equations estimated from the sample. These regression estimates will ordinarily be subject to an unknown bias making it impossible to estimate the errors of the various "corrected" estimates of magnitudes.

Another process in which the research worker is interested and which he cannot evaluate without rather detailed information is the formation of Final Revised Estimates after Census data are available. These estimates will be used in any attempt to recover information from past history. The appropriate revision will depend on hypotheses held regarding the composition and relative size of errors in the unrevised estimates and in the Census data. For example, if it were held that errors in unrevised estimates were independent from year to year but were large relative to errors in Census data, the appropriate adjustment would be to substitute Census data for unrevised estimates for Census years and to leave unrevised estimates for other years unchanged. Other hypotheses would lead to other appropriate adjustments.

It was indicated that when regressions are used in making forecasts or estimates the regressions are obtained by a visual fitting process and it was pointed out that this permitted allowances to be made for changes in the relationship over time and permitted greater weights to be attached to more nearly comparable seasons. Both these things can, of course, be done with computed regression equations. If regressions are computed the investigator must make explicit his assumptions about changes in relationships and weights to be applied. This, I believe, is an advantage. Too often in visual fitting assumptions that affect the result are hidden, and appraisal and criticism of the work becomes very difficult.

The above topics are cited as examples of some concerning which the useful information given in the present paper needs to be supplemented.

ESTIMATES OF AGRICULTURAL EMPLOYMENT AND WAGE RATES*

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OUR aim in this paper shall be to review rather briefly the history of the two types of agricultural-employment estimates, to describe in some detail the new series of employment estimates which will probably be released in our January 1949 Farm Labor Report, and to discuss in rather general terms the problem of estimating wage rates.

Employment Statistics

There are two basic approaches to the problem of estimating the number of people working on farms, or in any other sort of establishment for that matter. The first, commonly known as the establishment approach, consists of obtaining information from proprietors in regard to the number of people working in their establishments during a specified reporting period. Either complete enumeration of all establishments can be made, as in Censuses of Agriculture, Manufactures, or Mining; or information can be obtained from a sample of establishments, as is done by the Bureau of Labor Statistics and the Bureau of Agricultural Economics. The second, known as the population approach, consists of obtaining information about the employment activity of individuals either from them or from members of their households. A complete enumeration can be made, as was done in the 1940 Census of Population; or information can be obtained from a sample of households, as is done by the Bureau of The Census for its Monthly Report on the Labor Force.

The Department of Agriculture has been obtaining crop information from farmers for more than 80 years. It was only natural, therefore, that when the Department wanted information on farm employment the establishment approach should be used. In October 1923, four questions on farm employment were added to the General Schedule which was sent to the township reporters. These questions, which were used through November 1925, asked for information regarding employment on the crop-reporter's farm, as

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of the first of the current month and the first of the preceding month. In November 1923, for instance the questions read:

Farm Labor:

Number of persons working on this farm.

(Do not include household workers.)

(a) Family labor, including operator

No. on November 1 _____

No. on October 1 _____

(b) Hired help, including monthly, day, and piecework hands.

No. on November 1 _____

No. on October 1 _____

In December 1925, the two questions on employment as of the first of the preceding month were dropped and employment as of the first of the current month only was asked; the wording of the other questions remained unchanged. In January 1935, the wording of the questions was changed to correspond exactly with the wording used in the 1935 Census of Agriculture Schedule. The new questions read:

Farm labor—Persons employed. (See Note)

Number of persons working on this farm on or about January 1, 1935.

(Do not include persons doing housework.)

13. Family labor, include yourself and members of your family doing farm work without wages.

14. Hired help, include monthly, day, and piecework hands and members of your family paid wages by you.

The very long "note" referred to, which was probably read by very few crop reporters, introduced three new modifications. The first was that a person to be reported must have worked the equivalent of two or more days during a specified week. The second was that he or she must not have worked longer during that week at some other paid occupation. The third was that time spent doing housework, *not* people doing housework, was to be excluded. Although the schedule reads "Do not include persons doing housework," the note indicates that a housewife who, in addition to her housework and care of the children, worked the equivalent of two days during the week at farm work should be reported as unpaid family labor. A fourth change, or clarification in concept, which is accomplished in the wording of the questions themselves, is the exclusion of members of the family who are paid wages from the family-labor category and their inclusion in the hired-worker category.

There were difficulties in definition and interpretation of the questions which were not solved by the 1935 wording. Some of them have not yet been solved satisfactorily.

First of all, the definition of "farm work" was left entirely to the respondent and the application is therefore probably far from uniform. The housewife who not only cooks and cleans and sews but also churns, takes care of the chickens, and is responsible for the kitchen garden, provides the most puzzling problem.¹ Is her work in the garden and with the chickens farm work? How about the time spent in churning—is it farm work if the butter is for sale but housework if it is for home consumption? Must the wife actually work in the fields to be considered as doing farm work? Whatever decision the statistician may make regarding these questions, it is extremely difficult, in the limited space available on the General Schedule, effectively to explain to the reporter what should be considered farm work.

Second, what is the equivalent of two days? Is it ten, fifteen, eighteen, or twenty hours, or does it differ from region to region and from season to season?

Third, what is a farm? The Census, of course, considers each sharecropper's tract to be a separate farm. Relatively few sharecroppers serve as crop reporters, however, and there is a fairly general tendency for a plantation operator to consider all cropper tracts on his plantation as parts of his "farm" and all croppers and members of their families as family labor on his farm. Therefore, very large numbers of family workers are reported by a few plantations, and the presence or absence of a very few such reports makes a great deal of difference in the reported averages.

During the period from the inclusion of the farm-employment questions on the General Schedule in 1923, until January 1938, the Department of Agriculture did not attempt to convert the reported numbers of family workers and hired workers into absolute estimates for the United States and geographic regions. Instead, it published reported numbers of family workers, hired workers, and total workers per 100 farms.

Conversion to absolute estimates of numbers of workers on all farms in the United States was difficult for two reasons. First,

¹ Experiment in the Measurement of Unpaid Family Labor in Agriculture, Duff, L. J., and Bancroft, G., *Jour. of the Amer. Statistical Ass.*, June 1946, pp. 205-218.

crop reporters and their farms are not representative of all farmers and all farms. Not only are crop-reporter farms likely to be larger and better equipped than average, but there is also a tendency for general crop and livestock farms to be over-represented, since most of the questions on the general schedule relate to field crops. Specialized growers of fruit, vegetables, and all sorts of specialties, are likely to be badly under-represented or not represented at all.

As a result of this lack of representativeness on the part of the sample, employment per reporting farm is generally at a higher level than employment per farm for all farms. When large numbers of croppers are at work during cotton chopping and cotton picking time the tendency of plantation operators to report all the croppers on the plantation exaggerates the average number per farm.

The seasonal pattern of employment is also somewhat different on reporting farms than on all farms. The reporting farms more often employ workers during the entire year and usually report smaller fluctuations in the number of hired farm workers than all farms would. For instance, dairy farms, which are probably adequately represented in our sample, have much more stable labor requirements throughout the year than do commercial potato farms or celery farms, neither of which are adequately represented.

Second, in addition to an unbiased estimate of number of workers per farm, it is necessary to have an estimate of the number of farms (in order to calculate the product of the two, which would be the total number of workers in the United States or smaller geographical area concerned.)

Shaw-Hopkins Estimating Methods

Personnel resources allocated to the labor project of the Department of Agriculture were not large enough to permit grappling adequately with these two problems of adjusting for bias in General Schedule indications and estimating currently the number of farms. In 1936, however, the National Research Project of the Works Progress Administration on Reemployment Opportunities and Recent Changes in Industrial Techniques undertook the analysis of all available information on farm employment and the preparation of a set of farm-employment estimates by type-of-farming areas for the years 1909-1936. The techniques and adjustment factors were developed in cooperation with technicians of the Department of Agriculture and they have been used with very little

modification ever since. Therefore, a rather thorough description of this estimating method, devised by Shaw and Hopkins in the course of the Research Project, is in order.²

The initial step was the preparation, by states, of curves representing the normal seasonal variation in total farm employment on all farms. Three different types of data were used in the derivation of these curves. First, information on labor requirements was obtained from farm management investigations. Second, the central 50 percent of the reports of crop reporters regarding the number of people working on their farms were summarized. Third, information on the employment pattern on so-called typical farms, as determined by farm-management and small-scale farm-employment investigations, was utilized.

Serious logical objections can be raised to all three of these types of information. First, it is obvious that labor requirements vary from season to season in a different way than does actual employment, for labor is not utilized equally at all times of the year. The composition of the farm-labor force also varies from season to season. Second, to discard the two tails of the distribution of number of persons reported working on crop-reporters' farms may increase the stability of the sample average but does little to increase its representativeness. Third, the "typical" farms for which employment data were available had not been chosen at random but had ordinarily been selected for purposes other than the use to which they were here put, and so they probably did not in the aggregate constitute a representative sample of farms. But whatever their shortcomings, the first and third types of information were probably the best available for constructing the curves of normal seasonal employment.

These curves were expressed in terms of each month's percentage of the annual total. The crop-reporter averages per farm of total, family, and hired workers were also expressed as percentages of the annual totals. As the normal seasonal curves had been developed to approximate seasonal changes in total farm employment, and as no independent information was available on the distribution of total employment between family and hired workers, the distribution between these two classes of workers on crop-reporter farms was assumed to be representative, and separate normal employment

² *Trends in Employment in Agriculture 1909-36*, Works Progress Administration, National Research Project, Report No. A-8, Nov. 1938.

curves were derived for family workers and for hired workers. This procedure was followed for each state, after which the ratios of the normal seasonal to the crop-reporter distributions were calculated separately for family and for hired workers.

These ratios represented adjustments which would alter the seasonal patterns of family workers and hired workers as reported by crop reporters to conform to the estimated normal pattern. But they would have left the per-farm averages far above the level for all farms as indicated by the data on occupations from the 1930 Census of Population and the farm-employment data from the 1935 Census of Agriculture. Therefore, the percentage downward adjustments that were necessary to lower the seasonal patterns of per-farm averages to the Census levels were calculated and then applied to the ratios of the normal to the reported distributions, month by month, separately for family and for hired employment. The resulting adjustment factors, when applied to the reported average numbers of family and hired workers per farm, reduced the averages to the Census level and adjusted the seasonal variation to that estimated to be normal. When these adjusted per-farm averages were multiplied by the Census number of farms, they yielded absolute estimates of the numbers of family workers and hired workers who would have been enumerated had a complete census been taken every month during a census year rather than only once during the year.

Such factors were calculated for the census years 1930 and 1935 and interpolated for intervening years. Numbers of farms were also interpolated, so that monthly and annual estimates could be prepared for non-census as well as for census years. The 1935 adjustment factors and the Census number of farms were carried forward until 1940 Census data became available, at which time new adjustment factors were calculated. Interpolations of both the adjustment factors and the numbers of farms were made for the 1935-40 period, and the 1940 adjustment factors and number of farms were carried forward until the present time.

The estimates resulting from these calculations have represented all family workers and hired workers who worked two days or more during the reporting week on farms whose operators did not do 250 days or more work per year off their farms. Such arbitrarily defined part-time farms were deducted from the Census reported numbers and the estimated numbers of farms. Employment on

part-time farms, both family labor and hired, was at least theoretically excluded from the employment estimates. As operators of only a very few such part-time farms are among our crop reporters, employment on such farms is included only to a very limited extent in our crop-reporter indications.

There are several logical objections to these procedures, ingenious as they were. In the first place, as a bench-mark was available for only one date, the seasonality of the adjustment factors contained a very large subjective element. In the second place, the continued use of the same adjustment factors from year to year presupposed no change whatever in the direction and extent of bias in the crop-reporter indications. Third, carrying forward from year to year the number of farms which had been established for the preceding census year disregarded the fact that, although no accurate information might be available on the number of farms at annual intervals, the number was changing. What was obviously needed was more frequent unbiased employment information at different seasons of the year. But the Department had little or no money to spend on employment estimates, so further development in that direction was long delayed.

Labor-force Concept Developed

During the depression and recovery of the 1930's, a development took place outside the field of agricultural statistics which was to result in a new and independent series of farm-employment estimates. The acute administrative need for statistics on unemployment during the depression focused national attention on certain deficiencies of the gainful-worker concept that had been used repeatedly in the Census of Population.³ Young people hunting for their first job, persons who were working on the reporting date but were not usually employed, and former workers who had retired because of age or disability, represented difficult enumerative problems so long as the basis for classification was the "occupation" of the individual rather than his employment status during a specified period.

The first major attempt to shift over to a classification of individuals based on current employment status occurred in Michigan

³ *Labor Force Definition and Measurement*, Social Science Research Council, Bul. 56, 1947, Appendix A, *Development of the Labor Force Concept*, John D. Durand.

in 1935.⁴ This was followed by a Works Progress Administration sample Census of Partial Employment, Unemployment, and Occupations, in November 1937.⁵ Here for the first time a "sorter" question was used to divide the population of working age into two major groups, those working for pay or profit during the survey week and those not working. One set of questions was asked of those working; another set was asked of those not working. Other sorter questions further divided each major group, and each individual could ultimately fall into one and only one category. This technique worked so well and the labor-force concept was so generally accepted that in the 1940 Census of Population a shift was made to the labor-force concept. In the 1940 Census, as in all later surveys of the labor force, the reporting period has been a specified week. This period is long enough to be relatively unaffected by the Sundays, holidays, and other rest days that make employment as of a given day rather unstable. On the other hand, activity during the preceding week is much easier to remember than activity during the preceding month, and employment status is much less likely to change during the shorter period.

Beginning in March 1940, the Bureau of the Census⁶ has conducted a monthly survey of a sample of households, the purpose of which is properly to classify all individuals 14 years old and over as, (1) at work on a private or governmental job, (2) having a job but not at work, (3) not at work but actively seeking work, (4) not at work and not seeking work because of indefinite lay-off, or lay-off lasting more than 30 days, temporary illness, or the belief that no work is available in the community or in the individual's line of work, or (5) not at work and not looking for work for other reasons. The first two categories are considered to be employed, the next two categories are classified as unemployed, and the last group is by definition excluded from the labor force. The two categories of employed persons, at work and with a job but not at work, are divided between agriculture on one hand and non-agricultural industries on the other. Those at work in agriculture are further

⁴ *Michigan Census of Population and Unemployment, Employment and Unemployment Statistics, First Series 1935*, Mich. State Emergency Welfare Relief Commission.

⁵ *Census of Unemployment, 1937—Final Report Vol. IV—The Enumerative Check Census*.

⁶ *Labor Force Definition and Measurement*, Ducoff, L. J. Hagood, M. J., social Science Research Council, Bul. 56, 1947, pp. 9-10.

classified by sex, by hours worked during the week, by age, and by class of worker—as self-employed, unpaid family, and hired.

The techniques of selecting the households to be included in the sample and expanding the indications into national estimates have been covered adequately elsewhere⁷ and are not discussed here. A continuous effort is made to detect biases in the indications and to devise procedures for avoiding or correcting for bias.

The sample was designed to furnish only national estimates of employment and unemployment. It contains only 68 sample areas, so state estimates cannot be made from the sample indications. For the United States as a whole, however, the estimates of number of working farm operators, unpaid family workers, and hired farm workers, are widely accepted. The only outside types of information needed for their preparation are (1) the Census data used in designing the sample and (2) independent population estimates, by age and sex groups, which are used to “true-up” the sample indications. Furthermore, the MRLF agricultural-employment estimates possess the great virtue of fitting into a larger complex of labor-force and population estimates, derived from the same source and in the same way. Agricultural employment plus non-agricultural employment equals total employment. By definition, number of persons employed plus number of persons unemployed equals civilian labor force. Civilian labor force plus number of persons in the armed forces equals total labor force. Total labor force plus persons not in the labor force equals total non-institutional population. All of these categories include only persons 14 years old or over.

The estimates of agricultural employment published in the Monthly Report on the Labor Force differ materially from those prepared by the Bureau of Agricultural Economics by the Shaw-Hopkins method. The differences are due primarily to differences in concept. In the MRLF estimates, each person is assigned to only one classification; in the original BAE series persons working the specified minimum time were excluded if they worked more time outside agriculture. But the increase during the war in the proportion of the farm population having non-agricultural jobs has meant that the old adjustment factors do not eliminate all such persons from the estimates, if these persons did the required minimum

⁷ *The Labor Force Bulletin*, No. 5, Nov. 1945, Bureau of the Census.

farm work and were so reported. Furthermore, a person who works two or more days on two or more farms during the reporting week may be reported two or three times. Another difference between the two series results from the inclusion in the BAE estimates of varying numbers of children who are less than 14 years of age, all of whom are, of course, excluded from the MRLF estimates. A third source of discrepancy arises from the fact that whereas, on the MRLF schedule, employment is a matter of hours worked, on the General Crop Schedule the question is phrased as "the number of persons working two or more days" an expression which is susceptible of a wide range of interpretations. A fourth difference is found in the fact that persons with normally non-agricultural occupations (such as bookkeepers, typists, nurses, and airplane pilots), who are working on farms are excluded from the BAE series but are included in the MRLF estimates.

Despite the usefulness of the MRLF series, based on population surveys, in the field of labor-force analysis, there are many uses to which they cannot be put. More geographical detail is needed than they provide; specifically, hired-employment weights are needed for combining wage and wage-rate data into state, regional, and United States averages and indexes. Relationships between employment and size of farm, type of farm, income, and wage costs, are needed by farm-management workers. Early in the war rather detailed information on employment and wages in local areas and specific labor-intensive crops was needed upon which to base administrative action to prevent any curtailment of necessary food and industrial crop production because of inadequate labor supplies. As a result, in the winter and spring of 1942 the Bureau of Agricultural Economics made several employment and wage surveys by the interview method in labor-intensive areas, and four large mail surveys using a special list. From April through June of 1942, state estimates of farm employment were published; but at the end of the 1942 fiscal year the funds were curtailed, the large list was abandoned, and sole reliance in the preparation of regional estimates was placed on the General Crop Schedule indications, as before.

Recent Surveys Basis of New Definitions

As more and more persons left the farm for the armed forces and war industry, the farm-labor market tightened. By early 1945 the Bureau of Agricultural Economics, again having funds available,

launched a series of employment and wage surveys by interviews, using an area sample. These surveys, like the MRLF, were based on pioneering work done by the Works Progress Administration; but unlike the MRLF they were establishment rather than household surveys.

The primary purpose for which the enabling funds were appropriated was a study of the wage structure, but it is of course impossible to collect information on wages without also collecting information on at least hired employment, and in practice it is simpler to collect information on family employment at the same time. This was done in the March 1945 survey. The definition of two or more days of work for farm operators and unpaid family workers was followed; but information was collected regarding employment and wages for all farm workers who worked during the week for pay, even if the time spent was only an hour. The same definitions were used in a survey in May 1945. But in September 1945, information was obtained on the actual number of hours worked by the farm operator, the number of unpaid family workers working from one to 14 hours, and the number of unpaid family workers working 15 hours or more. The same questions were asked again in a similar interview survey in July 1946.

Each of these farm surveys covered approximately 20,000 farms in approximately 160 counties, and hired-employment expansions were made for four broad regions as well as for the United States as a whole. The sample used was designed specifically for efficiency in sampling hired farm employment.

In January 1947, and in April 1948, a general-purpose sample of 18,000 and 12,000 farms respectively located in about 800 counties was surveyed by interviewers. Among the subjects carried on the schedules were family employment and hired employment, wage rates, and wages. Information on the actual number of hours worked was sought in regard to all these groups of farm workers, so that any desired breakdown could be made. Similar information was obtained in an interview survey of 10,000 farms in 400 counties, taken in September 1948.

As originally published in the series "Wages and Wage Rates of Hired Farm Workers," the expanded indications from the interview surveys represented other concepts of farm employment than are used in the published series, and no attempt was made to harmonize them.

However, with rather reliable sample materials available for five

different seasons of the year from the interview surveys—that is, for January 1947, March 1945, May 1945, July 1946, and September 1945—the necessary factual basis for a rather thorough overhauling of the published series of estimates appeared possible and desirable. Ideally, interview surveys should be made at frequent intervals, much as is done by the Census in its MRLF surveys except that the establishment rather than the population approach would be used. However, as funds are not in prospect for frequent surveys of this type, it has seemed desirable, to redefine farm employment and to utilize the interview-survey data for the development of new adjustment factors, with a much smaller subjective element. The new definitions and concepts are as follows:

(1) Estimates of farm employment will include employment on all farms that meet the Census definition, irrespective of the time which the operator spends working elsewhere.

(2) The following persons will be counted as working during the survey week.

- (a) All operators who do any work at all,
- (b) All hired workers who work one hour or more for pay,
- (c) All unpaid family workers who work 15 hours or more.

These new definitions correspond much more closely than did the old ones to those currently used by the Census in its Monthly Report on the Labor Force. In fact, so far as persons 14 years old and over are concerned, there are only three differences: First, a person classified as a farm operator, unpaid family worker, or hired worker on the basis of an establishment report would be classified otherwise by the MRLF if he or she spent more hours during the survey week at some other gainful occupation; second, a farmer or a hired farm worker who doesn't do any work at all during the survey week because of illness, vacation, or weather, would not be counted as employed in our BAE estimates but would be called "employed but not at work" by the MRLF; third, persons with non-agricultural occupations but working for agricultural establishments would be included in the MRLF estimates but excluded from the BAE estimates.

Employment estimates under the new concept for both family workers and hired workers have been prepared for the 1940-48 period. They will probably be released early next year. We plan

that the current estimates from January 1949 on, will be on the basis of the new concepts. The steps involved in the preparation of these revised estimates were as follows:

First, the number of farms in each state was estimated for each year through 1947 on the basis of Census data, on information from several sources on the total acreage of land in farms, and on survey indications of average farm size. These estimates of numbers of farms provided the base to which adjusted numbers of family workers and hired workers per farm could be applied to yield absolute estimates of farm employment. The adjustment factors themselves were derived by a process which, in over-simplified terms, was something like this:

First, tentative absolute estimates of family and hired workers were set for each region and state for each of the five weeks covered by the already-summarized interview surveys. Second, as none of the survey weeks coincided exactly with the weeks for which employment had been reported on the General Crop schedule, interpolations for the interview-survey weeks were made between the crop-reporter indications for the two adjoining months. Third, absolute estimates for roughly corresponding months in 1944 were made by calculating the ratio of the reported numbers of workers per farm, in the 1944 months, to the interpolated reported numbers per farm for the survey weeks and then multiplying the estimates for the survey weeks by these ratios. Fourth, data on labor requirements for the year 1944 were adjusted for the varying length of farm work days throughout the year, and the resulting modified requirements were used as a basis for interpolating tentative estimates for the other seven months of 1944. Fifth, some state estimates were adjusted to bring them into agreement with the tentatively adopted regional estimates. Sixth, estimated numbers of workers per farm, family workers and hired workers separately, for each of the months of 1944 were calculated by states and regions by dividing the employment estimates by the estimated numbers of farms based primarily on the 1945 Census of Agriculture. Seventh, regional-adjustment factors for each of the 12 months of 1944 were calculated by dividing the estimated numbers of workers per farm by the numbers reported on the General Schedule. Eighth, state adjustment factors were calculated by averaging the 1943, 1944, and 1945 per-farm indications from the General Schedule and dividing the resulting averages into the estimated per-farm

number of workers. The 1943-45 average indications were used instead of the 1944 indications alone because of the instability of some state samples.

The 1944 adjustment factors were applied to crop-reporter indications by months, from January 1940 on (using the new estimates of number of farms) in the calculation of revised estimates of family and hired employment for the years 1940 through 1948.

It was of course desirable to shift the wording of the employment questions on the General Schedules from the old concept (working two or more days) to the new (working operators, working hired workers, and family workers working 15 hours or more). In order to make this change without a break in the indications, the General Schedule lists in all but a few of the smallest states were split in January 1948. Throughout 1948, half the lists continued to receive schedules containing the old questions, while the other half received questions based on the new wording. On the July 1948 General Schedule, for instance the new questions asked outside the South read as follows:

Farm work, including chores, on your farm during week of June 20-26.

Operator:

On how many different days during the week of June 20-26 did you do farm work or chores on your farm, or transact farm business?

——— Days.

Other persons working on this farm:

How many other members of your family worked 15 hours or more on your farm, excluding housework, during the week of June 20-26 without receiving cash wages? ——— Number.

How many other people worked one hour or more for pay on your farm during the week of June 20-26? (Include family members receiving cash wages.) ——— Number.

In the South, the questions regarding the operator and unpaid family workers were the same as in the North, except that the words "or plantation" were added after "farm" wherever location was specified. The hired-worker question was slightly changed by the enlargement of the parenthetical expression to read "(Include family members, croppers, and members of their families receiving cash wages.)" A new question was added to read as follows:

How many croppers and members of their families worked one hour or more on this plantation during the week of June 20-26 without receiving cash wages? (Do not include any persons already reported as working for pay.) ——— Number.

By comparing per-farm indications obtained from the old and from the new questions in the same state, it was possible to derive conversion factors which have been used to convert the 1944 adjustment factors for use with the indications from the new questions. From January 1949 on, only the new questions will be asked of the entire list in all states. Croppers and members of their families who are working without wages will be included with working operators and unpaid family workers to get indications of total family workers.

Although the new concepts are more precise and the new questions are more explicit than the old, and although the new adjustment factors are based on more objective information than were the old, estimates based on current crop-reporter indications should be "trued up" at rather frequent intervals by independent expansions from interview sample surveys. Unless this is done, the adjustment factors may become obsolete and the estimates may contain progressively larger errors. Likewise, current estimates of numbers of farms, based as they are on fragmentary and indirect indications may contain increasing errors, as the most recent Census is left further and further behind. Interview surveys furnish a check on estimated farm numbers at the regional and national levels. Ideally, we should like to make an interview survey every three months, but apparently we shall have to be content with the lesser accuracy achievable with semi-annual or annual surveys varying the dates from year to year to permit appraisal of the adjustment factors for the different calendar months.

Wage Statistics

Wage statistics in agriculture in the United States date back to 1866. In that year the Department of Agriculture made its first survey of average wage rates paid to hired farm workers. Mail questionnaires addressed to its crop correspondents were used. A second survey, covering the calendar year, was made in December 1869. The third inquiry was made in May 1875. All succeeding surveys until 1892 were made in the spring. When the surveys were made in the spring, the year to which the data apply is uncertain and is published as of "1874 or 1875." From 1892 to 1908, surveys were made in the autumn or winter.

These early wage-rate surveys were not made every year nor at regular intervals. There were 19 surveys in the period 1866 through

1908 Annual surveys were made from 1918 to 1923, while from 1923 to date wage-rate information has been collected quarterly, on January 1, April 1, July 1, and October 1

The records of wage rates per day are comparable from 1866 to 1923; during this period they were designated as for "other than harvest work." Monthly wage rates are not completely comparable. From 1866 to 1890, monthly rates were for workers hired for the year. The record from 1892 on shows no such distinction. The series on daily rates from 1923 to the present date have been for rates paid at the "present time." The rates from 1923 to date are more nearly comparable to the earlier annual rates for "other than harvest work" than to rates "for harvest work," or any combination of the two types of rates.

The series of wage rates back to 1866 have been for four types of rates: Per month with board; per month without board; per day with board; and per day without board, by states. Index numbers have also been computed on a 1910-14 base. Since 1923, when the quarterly series was started, the wage-rate questions on the General Crop Schedule have read as follows:

Wage rates (average rates being paid to hired farm labor at the present time in your locality).

1. By the month with board
2. By the month without board
3. By the day with board (including average daily earnings of piece-workers)
4. By the day without board (including average daily earnings of piece-workers)

Weighting individual state wage rates to obtain averages involves three processes. The first is the combination of state wage rates to obtain geographic region estimates and U.S. estimates. The second involves combining the different types of wage rates into a wage-rate index. The third is the calculation of annual average rates from quarterly rates.

Numbers of hired farm workers are used as weights in calculating U.S. and geographic region estimates from State data. Employment data from the Census of Occupations were used from 1866 to 1908; and from 1909 to 1922 employment data from the 1910 and 1920 Censuses of Agriculture were used. Since 1923, monthly employment data collected by BAE have been used for weights. The series was reweighted in 1938 by the new estimates of hired

employment released at that time. For the period before 1938, average hired employment for three months was used for weighting; the current estimates since then have been weighted by hired employment for the current month.

In combining different types of wage rates into a monthly composite, estimated numbers of workers receiving each type of rate are used. These estimates are based on percentage distributions of workers by geographic regions derived from a survey made in 1927. Daily rates are converted to a monthly basis by multiplying by 20—a factor which was chosen because it gave approximately the same monthly rate as that reported, and appeared to be a reasonable approximation of the days a hired hand would work.

The third type of weighting is that required to prepare annual averages. Since the data on wage rates and employment are for the first of the month, it was necessary to weight the wage rates to center on July 1, the center of the calendar year. To do this, January current rates are weighted by $\frac{1}{2}$ of January employment plus February's; April rates are weighted by March, April, and May employment; and so on through October. Wage rates for January 1 of the following year are weighted by employment for December and half of January of the following year.

Criticisms of Farm-Wage Rate Series

The BAE series of farm-wage rates is open to several criticisms. The absolute level of wage rates is one of the first points to be questioned because of the type of question asked. As farmers are asked to report average wage rates for the community with which they are familiar, the reported averages depend upon the ability of the respondent to appraise the relative importance of wage rates other than the "going" rate. There is some evidence that reported rates may be more nearly rates for able-bodied men than average rates for all hired workers. The year-to-year change, however, is probably more nearly representative than the actual level of wage rates.

Another criticism of the current wage-rate series is that they do not cover all types of wage rates. Coverage of wage rates varies widely from season to season and from region to region. The most complete coverage of all wage rates is obtained in the winter months in the North and South Central and the Mountain States, when from 60 to 80 percent of workers are paid the types of rates which are currently reported. Coverage declines in all regions during the

harvest season, when piece-work rates are most important. Rates for piece-work are supposed to be converted to daily earnings and entered in the daily-rate average by the respondent, but it is doubtful that this is often done. Recent experience with interview surveys indicates that it is usually difficult to get data on piece-workers directly from the operators who are employing them even when the operators have fairly accurate cost accounts. It is therefore practically impossible for a respondent to convert piece-work rates into earnings for a community with a high degree of accuracy.

Terminology used on the current wage-rate questions is indefinite. The terms "with board" and "without board" are not specifically defined and may be interpreted in different ways by different respondents. The "without board" category of rates is probably a mixture of rates for persons receiving a house and those receiving no major perquisites. When the present questions regarding wage rates were set up the questions undoubtedly fitted the practices then in effect. The "with and without board" questions separated the workers paid only cash wages from those who were receiving major perquisites in addition to cash wages. Hiring practices have become much more varied, however, so the questions that were once suitable have become antiquated.

Recent Wage-Rate Series Changes

The wage-rate program of the BAE proceeded for many years with little change. During the war, more interest began to be directed toward farm labor because of the manpower situation and the imposition of wage ceilings. A program to collect wage data for individual workers was started in 1942 but came to an early end the same year. More significant results were achieved from the enlarged wage program, initiated in 1945.

This program was divided into two parts. The first part consisted of interview surveys regarding wages and wage rates of hired farm workers in small areas, with a high concentration of specialty crops. Seventy-five areas were covered in 1945 and one area in 1946. Data for most of the areas were collected from a sample of farms, but in a few cases samples of workers in labor-supply centers were used. Results of these surveys were published in the BAE series "Surveys of Wages and Wage Rates in Agriculture."

The second phase of the program consisted of nation-wide interview surveys of a pre-selected sample of farms to obtain detailed

farm wage and employment data for the nation and four major geographic regions. Results of these surveys are being published in the series called "Surveys of Wages and Wage Rates in Agriculture." General reports have been published for the surveys of March, May, and September 1945, July 1946, and January 1947. Surveys of April and September 1948 are now being processed.

Interview surveys have been used to collect such information about individual workers as farm and worker characteristics, wage rates, time worked, weekly earnings, perquisites received, and type of worker. Data on value of perquisites were obtained in the survey of May 1945.

A program of interview surveys at quarterly intervals has not yet been made a permanent part of the BAE program. Consequently, extensive overhauling of the wage-rate program, which depends on mailed questionnaires is underway. An attempt is being made to bring the wage-rate series into better agreement with current practices as revealed by interview surveys.

The first step in this program of revisions has been the establishment of a new set of wage rates by types. A group of nine types of wage rates will be used for the new series. Not all types of rates will be asked in every state, but only the rates of major importance in each geographic region. The number of rates will vary by regions from four to six, with six rates asked for in only one region. The types of rates are as follows.

- Per month with board and room
- Per month with house (no meals)
- Per week with board and room
- Per week without board or room
- Per day with board and room
- Per day with house (no meals)
- Per day without board or room
- Per hour with house (no meals)
- Per hour without board or room

Piece-work rates are not being asked because experience has shown that it would be practically impossible for a respondent to estimate earnings of piece-rate workers with any reasonable degree of accuracy. But earnings of piece-rate workers approximate fairly closely the rates per hour without board or room.

The first step toward the use of new wage-rate questions was taken in January 1948. At that time the general crop-reporter mailing list was split into two parts. One part received question-

naires with the old questions and the second part received questionnaires with the new questions. This was continued for each of the quarterly wage-rate questionnaires. In a few states where the sample was very small, only the old questions were used. Beginning with January 1949, only the new questions will be used in all states. The device of splitting our mailing list and using both new and old questions during the four quarters of 1948 makes possible the splicing of the wage-rate index.

Weights for combining wage rates and conversion factors to change all rates to hourly equivalents have been set up for each quarter on the basis of the data from the interview surveys. These weights were required for each quarter because of the variation from season to season in the percentage of workers paid different rates. Per hour rates without board or room will be weighted by the percentage of workers receiving piece-rates as well as by the percentage of those receiving the per hour rate. The weights for rates of relatively little importance will be added to those for the most similar rates asked.

Another part of the project of revising the wage rates will be the reweighting of the quarterly wage-rate series. The old 1927 weights, in addition to being badly out-of-date, are based on an annual average. New weights will vary from quarter to quarter. Although considerable subjective adjustment of weights may be necessary at first, the quarterly weights should more nearly represent actual payment practice than the constant set of weights now used.

The new set of wage rates is not expected to be completely devoid of all the shortcomings of the old series, for they will be based on the answers to locality questions rather than on answers to individual farm questions. It is expected, however, that the new wage-rate series will be an improvement over the old, and give a more realistic picture of the actual wage-rate situation. They are not based on the type of information which would be collected on an unlimited budget, but they represent a practical compromise.

THE SOCIAL SCIENCES IN EXPERIMENT STATION RESEARCH*

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MORE than sixty years ago the Federal Government began to provide for American agriculture research facilities that it could not provide for itself. During the early years these federal contributions to the experiment stations and the Department of Agriculture were not consciously designed to overcome a handicap on the part of farmers in comparison to industrial enterprises. Many industrial concerns were not then in corporate form, and few of them had research laboratories. But research had been going on informally for a long time, both in agriculture and in industry. We need only to think back to the time of Jethro Tull, of Arthur Young and of Robert Bakewell to realize that farmers of inquiring mind had long been experimenting and observing relationships with a view to increasing productivity, reducing costs, and husbanding soils.

Industrial experimentation in these earlier years was mostly individual and mostly mechanical. Some stimulus, which we need not trouble to identify, brought a remarkable upsurge of inventiveness in the English-speaking world during the decades before and after 1800. Many of the inventions developed in the United States had to do with farm operations, but the change was by no means confined to agriculture. Both in industry and in agriculture the emphasis was on mechanical research; how to do the same things faster and with less labor. There was little concern with quality improvement or development of new products. This was a logical emphasis. The new country was short of labor and short of goods of the customary kinds.

Machines could be invented, built, and tried out by individuals, and the process required little in the way of special training or facilities. It was not until chemical, biological and physical investigations came into prominence that research organizations began to be set up. Those in agriculture were among the first, but industry, under private financing, soon outstripped agriculture in the pro-

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vision for formal research. In recent times the great chemical companies, the oil companies, the meat packers, the electrical equipment manufactures and the makers of airplanes spend tens of millions on research each year. The feeling has grown that agriculture, with its small segment form of organization, must have its public support greatly increased if it is to make progress in keeping with that of industry which can finance huge research projects privately because of its corporate form of organization.

All this is familiar ground to you. My reason for bringing it up is to examine more closely and in greater perspective some of the conclusions we are prone to draw when viewing these problems at short range and in small segments.

Social Science Approach Not New

Until the social sciences came into prominence in the 1920's it was generally assumed that research in agriculture had always been pretty much confined to its physical and biological aspects. In broader perspective this is not true. The Physiocrats of eighteenth century France engaged in extensive speculation about the place of the extractive industries in the economy, and worked out a theoretical framework in which these industries were given first place as the fundamental producers, the appropriate sources of taxes, and so on. Around 1800 British students began to examine agriculture in ways that were more in keeping with the methods of modern science, and which laid the foundations for the modern sciences of economics and sociology. Ricardo developed, from his observations in agriculture and the study of earlier writers, the first careful formulation of the laws of rent, and also a theory of wages. Malthus, likewise with an eye on agriculture, formulated a body of doctrine concerning the relation of population to food supply that attracted much attention in the setting that then existed, and which now is again receiving attention from scientists all over the world.¹ Forty or fifty years later, John Stuart Mill began to concern himself with the social structure of agriculture, and did pioneer work in what we would now call rural sociology.

The point I wish to make is that the social science approach to agricultural problems is not something new and without precedent.

¹ The layman is likewise beginning to come to grips with this fundamental problem of a vastly increased rate of population growth in relation to a much slower increase in food production.

Fundamental, and in some measure scientific, study of agricultural problems reached a high level in the social sciences during this early period, particularly in the work of Ricardo and Malthus. The thinking of these students was, however, so broadly applicable as to cause their followers to turn more and more toward study of commercial and industrial economics. The result was that social science studies of agriculture virtually disappeared for nearly half a century.

It was during this last half of the nineteenth century, when the social scientists were concerning themselves mainly with industrial and commercial phenomena, that the agricultural experiment stations were established. They very properly began work on the vast array of problems close to the farmer; studies in crop improvement, animal breeding, soils and fertility and so on. In these early years techniques were little developed, scientifically trained workers were few, and the problems were relatively simple. Much experimenting needed to be done, and first approximations of considerable significance could be achieved with relatively crude methods. The new field of research was fortunate in drawing to it at an early stage a number of men of considerable stature; such men as Bailey, Hilgard, Henry, Davenport, and later Russell and Hunt. They were able to identify important areas for study, to select able men; and, as a result, set a pattern of research that has been enormously productive. Out of it has grown much significant work, some of which, like the work of the early economists, has contributed to interests wider than those of agriculture. The modern science of human nutrition owes much of its original impetus to researchers in the agricultural experiment stations, and important contributions have been made in pathology and entomology.

The very success of these early developments in the natural science aspects of agriculture led to preoccupation with them to the exclusion of most other types of study. But it would be a mistake to assume that there were no social science problems in this period, or that farmers were not concerned about them. Through the 1870's and 1880's the farmers were taking the lead in bringing about orderly control of railroad rates and financing; they were experimenting with new methods of marketing; they were intensely interested in monetary policy as evidenced by their vigorous espousal of the greenback and free silver movements. They were likewise concerned with sociological and cultural problems as

shown by their quick response to the Grange program, and the efforts of the Farmers' Alliance and other organizations to foster educational and social activities. But the social sciences were not equipped to serve them, and rather generally the farmers looked to political action and political leaders for solutions to these problems.

Social Science Research Handicapped

Why, then, in view of their early leadership in the field of agricultural research were the social sciences so backward and impotent? The reasons are varied and rather complex. I shall not try to list all of them. Statistical research, which many regard as the "scientific" approach in the social sciences requires large bodies of data and refined methods of statistical analysis. Since given variables or controls cannot be held constant, as in many natural science investigations, the data must be comprehensive enough to permit use of such methods as those of partial and multiple correlation; in other words, to make it possible to measure, and allow for, the effect of a variable that cannot be controlled.

At that time the basic data for such studies were not available, nor were the statistical techniques. Both of these are, in the main, developments of this century. The United States census was put on a more scientific basis in 1880, and it began to be possible to study such things as farm tenure, population changes in agriculture, values of farm lands, and so on, though significant studies could not be made until such data had accumulated for several decades. The Department of Agriculture was accumulating useable data on crop acreages, yields, numbers of livestock, market movements, etc. Orderly series of price data were becoming more available, and such agencies as the Interstate Commerce Commission, the Bureau of Corporations, and the Comptroller of the Currency were beginning to require more adequate duplication of data about corporations and other businesses.

I do not want to leave the impression, however, that the statistical approach is the only scientific one in studying social science phenomena. The basic purpose of research is to increase understanding of our environment, both physical and social. We normally combine with that a second step which goes beyond research; namely, an attempt to use that understanding in devising practical solutions to our problems. But unless we have first achieved a sound understanding of the processes themselves the "solutions"

are likely to prove faulty and sometimes even harmful. The social sciences use numerous techniques, of which statistical analysis is only one. For example, the case method, in some fields the experimental approach, and in still others the construction and analysis of "synthetic" models. Qualitative analyses often are of the greatest importance, especially in the early stages of research or in respect to relationships that do not lend themselves to quantification. But almost all of these methods require techniques and sources of general information that were relatively unavailable prior to 1900.

Lacking such resources the economists turned more to the philosophical rather than the quantitative approach. It was by no means, however, a period devoid of inductive investigation. Nevertheless the economists of that period were not in a position to give farmers, legislators, and businessmen solid studies on the effects of tariffs, monetary measures, freight rates, and marketing practices.

Farmer interest in economic and social problems, as farmers, was relatively quiescent in the period of rising prosperity that extended from 1900 to 1920. But the depression of the 1920's, and even more so that of the 1930's, revived and intensified farmer interest in the economic aspects of agriculture. A new and complex set of problems had arisen. These did not lend themselves to simple political slogans such as the issuance of more greenbacks, free coinage of silver, or the control of railroad rates. Farmers wanted more information; primarily information relative to prices, marketing efficiency, methods of social control and so on.

The Congress reflected this interest by passing the Purnell Act of 1925, and again through the Bankhead-Jones Act of 1935. More recently it has thrown the balance heavily in the direction of marketing research in the Act of 1946. Collaterally it sought, through provision of the regional research laboratories, to achieve for agriculture some of the kinds of gain that industrial corporations and processing agencies had obtained through scientific research. This emphasis became apparent not alone in the regional laboratories but in the experiment stations and the Department of Agriculture as well.

But the results flowing from these new legislative emphases were not wholly satisfying. The social sciences, to be sure, were coming back into the limelight in the agricultural realm, but in a new form, and with almost no contact with the earlier develop-

ments in agricultural economics. It was not economists who led the way, but rather agronomists such as Warren, Spillman, Handschin and Boss. They began to study the economics of the individual farm, not that of the agricultural industry. Their approach was narrowly occupational, and little concerned with the broad interests of society as a whole. They studied farm management, marketing, credit, and tenancy, and later price analysis. But many of these early studies were crude and scientifically unsound, just as many of the early natural science researches were crude and scientifically unsound. But a more adequate attack on the social science aspects of agriculture was taking shape. Notable progress was made in the 1920's; in the refinement of data, in methods of analysis, and in the training of personnel; and there was coming into being a clearer perception of the kinds of problems needing study.

Financial resources were not shifted in the direction of social science studies as fast as farmers or the Congress desired, nor as much as the language of the legislative acts implied. Research in the natural sciences was more mature and probably more productive than that in the social sciences. Most station directors were natural scientists, aware of the problems of natural science research, in sympathy with its methods, and at home in its language. Few of them understood the social sciences well enough to know what was good research and what was not, or why these methods so foreign to their experience and apparently so lacking in scientific precision were necessary. The station programs remained heavily oriented to natural science research, and probably wisely so. The need for more social science research existed, but the social scientists probably were not equipped to use effectively more funds than they got. Some of the funds assigned were not used effectively or on significant problems. While perhaps more apparent in the social sciences, that defect has not always been absent in natural science researches either.

The great depression of the 1930's and the programs associated with it brought a new situation. Real research in the social sciences almost disappeared. Nearly every social scientist who was trained or semi-trained, and many who were not trained at all, was catapulted into the operational activities of a vast and somewhat chaotic social experiment, much of which was on a trial and error basis. In more mature form and with better defined objectives, this was continued through World War II.

We have seen that the Congress and the farmers have been crowding the experiment stations in the direction of more research in the social sciences. In the Acts of 1925 and 1935, and even more vigorously but much more narrowly in that of 1946, the legislators have been saying, "We want solutions to our economic and social problems." Somewhat glibly they have often said, "We don't want the kind of research that shows us how to make two blades of grass grow where one grew before. We want to know how to sell our products for more money."

But when they come right to grips with their real problems, that is not the bent their interest takes. Basically they are wiser than their slogans would indicate. They want help on their own individual problems and many of these are technological production problems. The State of California has for the past two years had an officially established agricultural research study committee made up of agricultural leaders from over the state. Its function is to indicate to the Governor and the University of California the problems these farm leaders think should be given study. Their 122-page report for 1947 contains a fair sprinkling of economic projects, but page after page of it consists of recommendations for research on technological problems. On the other hand one cannot read the early reports of some of the national research advisory committees without feeling that they either have not recognized or have shied away from some of the broader problems that they should have considered, and have confined themselves too exclusively to somewhat minor technological problems.

Selection of Significant Problems Important

But this does not mean that the farmer is not concerned over problems in the social science fields. He is deeply aware of them, but he doesn't know how to state or formulate them. It is easy to see the problem created by mildew on a grapevine or the effects of rust on a field of wheat, but a vastly different thing to understand the nature of a sudden contraction of credit or purchasing power or international trade as it affects the prices of the things the farmer sells. Here more professional help will be necessary in selecting significant fields of research. Except as the efforts in this direction are wisely chosen and competently executed, the wastage of funds will be enormous.

One reason for this lies in a fundamental difference between social science research and natural science research, a difference

that needs to be recognized but not overemphasized. In many of the natural science researches a given relationship can be reproduced ad infinitum by reproducing the given set of conditions.² Hence much time and effort can properly be used in determining very accurately and bit by bit a whole series of relationships leading up to a solution that will, relatively speaking, stay put once it is arrived at. In the social sciences this is usually not true. A given set of social conditions does not remain fixed, and cannot be reproduced. The action implied by the finding is often one that needs to be taken at a given time, and the value of the study may decline rapidly after that time is past.

This means that for many of the social science studies the major emphasis should be different than in the natural sciences. It means emphasis on building up and continuing as accurate and detailed a body of data as possible, developing the techniques for analysing these data quickly and dependably in relation to any given problem situation, and having constantly in hand a complex body of realistic information concerning the institutional setting in which action will need to be taken. For example, if a researcher in price analysis is to give effective aid to a marketing organization on a specific problem he must have at hand most of the necessary data, he must have tried out repeatedly on past situations his techniques of analysis, and he must be well acquainted with the practical operations of the industry and its marketing institutions. His knowledge must be broad enough and deep enough so that he can judge well the significance of the many qualitative factors that cannot be reduced to statistical form.

Similar considerations apply in studies of farm management, those pertaining to the use of credit, to studies in tenancy, farm leasing and so on. This means specialization, so far as those types of research are concerned. In some cases specialization by commodities, in others by area or type of farming, and so on.

But these operational types of research, though the ones best understood by farmers, are by no means the major phase of social science research needed by agriculture and implied by the agricultural experiment station legislation of recent years. The Act of 1935 specifies research "into laws and principles underlying basic

² This is by no means universally true, however, even in the natural sciences, as any soil scientist or plant ecologist, or nutritionist will affirm.

problems of agriculture in its broadest aspects," and the Act of 1946 repeats that language. What kind of studies are thus implied? These certainly cannot be quickie studies related to some immediate operational decision. Neither can they be, if they are to be worth their cost, studies which will quickly be invalidated by changing conditions. Few of the findings can have the permanence of natural science results arrived at through long years of patient experimentation, though even these latter eventually become outdated. In most cases the social science researches are more likely to be studies of far-reaching importance that increase understanding of how the social organism works and that thus become the basis for national or state legislation, for instruction in schools and colleges, and for better orientation of the individual farmer to his environment.

Let us consider a few examples. The farmer's interest is heavily affected by monetary and fiscal policy. He has sensed that for a hundred years and at times has tried to do something about it through political action. In the 1930's he saw the value of his investment shrink by 30 billion dollars, largely as a result of monetary factors. Where are the best focal points for him to take hold in trying to stabilize this situation? In the 1920's and '30's farm leaders contended that restoring agricultural incomes would go a long way toward restoring the economy as a whole. Was this true or not? A study of that kind is no job for an amateur. It will require the best and most broadly trained people that can be found. Such a study will not be done quickly. It may take years. But if it is well done its findings will have validity for a long time to come.

Let me mention another example. The social structure of agriculture is being profoundly affected by mechanical and technological change. Because of the automobile, the highway system, the tractor, and innumerable other technological developments the whole pattern of rural schools, churches, social life, size of farm, and tenure is being modified. Whole groups of farm people are at times uprooted or rendered jobless by changes of this kind. If we are to act wisely in such situations and point the way toward constructive adjustments we must know much more about where this road is leading. Both the sociologists and economists, and also the home economists, need to work on it. It calls for large-scale studies of lasting significance.

We have huge projects like the Central Valley of California, the Missouri Valley, the T.V.A. and the Columbia Basin which may

change the lives of people in whole regions. These again are proper subjects for ably conducted long-term major studies that, if well done, will not be quickly obsolete. This does not mean that such problems can somehow be brought to a definite solution through some large-scale, specifically timed appropriation. The best we can hope for is more information, better understanding, and a sounder basis for the policies adopted.

We have proposals for extending a social security system to farm workers and employers. We know too little about how it would work or what it would mean. Yet it would affect us, our children, and our children's children. On problems like these we need able and fundamental studies on which to base our attitudes and policy. We have a marketing system in which a reduction of prices to the farmer often means an actual widening of the margin between his price and the consumer's price, and nearly always a widening of the percentage margin. Can we do something about it? The list could be enlarged almost indefinitely if time permitted and any purpose would be served. Naturally such studies cannot and should not be undertaken all at once or by any one institution. The smaller and more current ones can and should be carried on in nearly every state. The big ones require much planning, the availability of mature, well-trained researchers, and much time. Some of them will require interstate collaboration. Where they should be done and how depends very much on the location and qualifications of the available or obtainable personnel. Many studies of regional or national significance can best be carried out in some one institution. Research should not ordinarily be set up on a regional basis unless there are important reasons for so doing. Regionalization is not an objective in itself, but a mechanism for doing things that cannot be done by the cheaper, more convenient, and less cumbersome method of individual station research.

But to come more to grips with the kinds of problems faced by administrators like yourselves, we need to consider such matters in a different light. There are big unsolved problems in the natural sciences, too. With a given budget and a given set of congressional directives how shall funds be apportioned for the various kinds of research? How can the social science phase of the work be organized to get an appropriate balance between these broad, far-reaching problems and the shorter-term, small-scale projects that are more directly useful to farmers and their organizations? Certainly it

would be presumptuous to suggest any specific set of criteria. Some general comments may, however, bring up questions that you will think worthy of further consideration.

First as to balance between natural science and social science research. Certainly no hard and fast rule is appropriate, nor is uniformity between states desirable. It seems apparent, however, that, with the Acts of 1925, 1935, and 1946 the Congress expressed a feeling that experiment station research should be rounded out on the social science side.

*Increased Funds are Both an Opportunity and
a Responsibility*

The substantial expansion in funds authorized in the Act of 1946 provides both an opportunity and a responsibility. The authorization, in other words the opportunity, is not likely to be fully implemented unless the responsibility is accepted sincerely and competently. We do not want to sacrifice the values that have come down to us from the pioneer period in agricultural research. They are important and fundamental. At the same time we cannot be content with following the patterns of the past. If the experiment stations are to continue to be accepted as the primary centers for agricultural research in the states, their programs will, of course, have to include pretty broadly the range of agricultural problems facing farmers and the general public. This means that they cannot neglect broad social problems such as those mentioned earlier. If the experiment stations omit them from their programs, studies of these types will be undertaken elsewhere, and eventually the funds appropriated will go into the channels where the kinds of work desired are being carried forward.

This does not mean that the experiment stations should follow subserviently the whims of popular interest or the directions indicated by sincere but inadequately informed proponents of this or that type of research. Researchers have a very real responsibility to exercise leadership and to help the public to see what are the important and manageable problems, and the points of emphasis most likely to be productive. The layman cannot know these things at first hand. What layman, for example, would have suggested the researches which led to the current studies of atomic energy or those of Pasteur in bacteriology, or those of Steinmetz in electricity? Farmers and other laymen can helpfully indicate their problems as

they see them. Only trained researchers and administrators can determine where research is likely to develop new information and to be significant. If the vision of administrators and researchers is too narrow or too much influenced by the patterns of the past, the research program as a whole will fail to achieve its greatest possibilities.

The Research and Marketing Act of 1946 is a case in point. Its emphasis is very heavy on marketing and on the utilization of waste products, which in the sincere opinion of its drafters were the areas offering greatest possibility of results. Is this opinion well founded? Many competent researchers have doubts, and also are of the opinion that those who discussed the problem in the hearings relating to it underestimated the amounts of research already underway in these realms and the knowledge about them that now exists. All would agree that there is much pertinent information about marketing channels, marketing margins, factors affecting costs, and so on that we do not have. There is a large field for research in marketing, but it by no means embraces the whole field on which fundamental research should be undertaken. Even in marketing there is very real danger that these funds will be dissipated in minor, fringe studies without coming to grips with the really important problems of that field. There is, of course, a place for many small-segment researches, but these in the main were feasible heretofore. They do not require or imply the elaborate, well-financed program authorized in the Act of 1946.

The administration of this and the other acts needs to be flexible and to be courageously directed toward research in the most significant and promising lines, this being done, of course, in full and frank consultation with the congressional and agricultural leaders concerned. Those leaders want significant results just as we do. If their legislative emphasis results in something other than even progress on the whole research front, in order of real rather than assumed importance and manageability, they will be ready to recognize that fact as they come into closer contact with the issues involved.

It may well be that more emphasis on the economics of consumption will be needed. Farmers and the public may very possibly find they have a growing concern with the great changes in social structure that are occurring in the rural areas which call for policy decisions on their part. There is considerable need, which many

farm leaders are coming to recognize, for study by political scientists of the workings of farmer representation in the national programs affecting agriculture, and of the policies and organization of the many federal agencies that farmers have to deal with. There is a widespread feeling that our social problems are growing faster than our understanding of how to deal with them, and even, in some circles, that the very speed of our technological progress is generating social problems we are not yet equipped to solve. On the other hand, we are almost certain to find, as our population increases and our resources are more fully used, a renewed emphasis on natural science research and conservation. If the program can be kept flexible and forward-looking, and if it can base solidly on the criteria of relative significance and amenability to research accomplishment it will be on a sound foundation, and will achieve the recognition it merits.

FARMERS' PRICE ANTICIPATIONS AND THE ROLE OF UNCERTAINTY IN FARM PLANNING

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THE study which is described below was an attempt to obtain more precise notions regarding the nature of farmers' anticipations. More specifically, it was concerned with exploring (1) the nature and degree of uncertainty attached to particular price and yield anticipations, and (2) the ways in which these anticipations were related to (stated) production plans. No attempt was made to investigate "forecast equations" for price anticipations, although these were investigated for crop yield expectations; and conjectures regarding the nature of price "forecast equations" can be formed by relating anticipations to current and past data.

The theoretical model which underlies the investigation is the currently accepted non-static theory of production.¹ In this theory there is assumed the following:

- (1) That the firm is attempting to maximize something, i.e. that it is able to order various situations according to their desirability.
- (2) That it is faced with conditions of production in which there exists a known time lag between plans (for purchasing or using resources, for example) and the fruition of these plans (the sale of product).
- (3) That decisions are based upon anticipated values.
- (4) That various situations are anticipated with various probabilities of realization (or distributions of probabilities of realization).
- (5) That anticipations grow out of the current and past experience of the entrepreneur.

Assumption (1) provides conditions for consistency in the firm's

¹ Examples of non-static theories of production may be found in Gerhard Tintner, "The Theory of Production Under Non-Static Conditions," *Journal of Political Economy*, Vol. L, pp. 645-667 (October, 1942) and "The Pure Theory of Production Under Technological Risk and Uncertainty," *Econometrica*, Vol. IX, pp. 305-312 (July, 1941), J. R. Hicks, *Value and Capital*, Oxford, The Clarendon Press, 1939, Parts II and IV; H. Mackower and J. Marshak, "Assets, Prices and Monetary Theory," *Economica* (new series) Vol. V, pp. 261-288 (August, 1938) and A. G. Hart, "Anticipations, Uncertainty and Dynamic Planning," *Studies in Business Administration*, Vol. XI, Chicago, University of Chicago Press, 1940.

conduct, while the other assumptions are a description of what is generally believed to be the nature of the decision-making (technological and market) framework facing the firm. Assumption (5)—the postulate that there exists a “forecast equation”—makes it possible to relate values of certain variables at one point in time to the values of the same (and other) variables at previous points in time.

In devising and conducting this experiment the authors had the benefit of experience gained from a previous study.² Even so, it is believed that the information obtained might have been made more reliable had more time been spent in designing the interviews. Since the sample was drawn from farms in a block of six central Iowa counties where cash-grain farming predominates, the inferences regarding the anticipations of farmers as a group which one might make from this study are obviously restricted. The study may prove useful, however, in indicating pitfalls which might be avoided in further studies of similar character and in suggesting additional areas for investigation.

Data were collected by means of personal interviews with 54 Iowa farmers during March, 1947—a period just prior to the beginning of crop operations. The interviews were designed to obtain some notions regarding (1) the most probable values of the distributions of anticipated prices, (2) the dispersions of these distributions, (3) the farmers' production plans, (4) farmers' beliefs with respect to technological conditions which deterred plans from conforming to what otherwise would appear as profit maximizing plans and (5) the “uncertainty preferences” of farmers.

Corn and Soybean Price Expectations

Each of the farmers interviewed was asked to indicate (as of March, 1947) what he anticipated as the most probable prices which would be paid for corn and for soybeans in December, 1947. The answers to this question may be considered as being somewhat ambiguous since prices differ with the grades of the product, and the pattern of prices varies geographically, yet no definite grade or place at which this price would be paid was specified. However, it is presumed that the place which the farmers had in mind was

² See T. W. Schultz and O. H. Brownlee, “Two Trials to Investigate Expectation Models Applicable to Agriculture,” *Quarterly Journal of Economics*, Vol. LVI, pp. 487-496 (May, 1942).

central Iowa and that farmers were referring to the average grade of the commodity. The frequency distribution of expected most probable prices for these two crops is given in table 1.

TABLE 1. FREQUENCY DISTRIBUTION OF MODAL PRICE
EXPECTATIONS FOR CORN AND SOYBEANS

CORN			SOYBEANS		
Most probable anticipated price per bu	Frequency of anticipation		Most probable anticipated price per bu.	Frequency of anticipation	
	<i>Number</i>	<i>Percent</i>		<i>Number</i>	<i>Percent</i>
\$1 50	7	13	\$3 70	1	2
1.25	6	11	3 00	3	6
1.15	1	2	2 85	1	2
1.10	4	7	2.75	3	6
1.05	1	2	2 60	1	2
1.00	23	43	2.50	14	30
.90	4	7	2.35	1	2
.85	1	2	2.25	6	13
.80	6	11	2 15	1	2
.75	1	2	2.10	1	2
			2.05	1	2
Mean \$1.07	54	100	2.04	6	13
			2.00	5	11
			1.85	2	5
			1.80	1	2
			Mean \$2 37	47	100

The mode of the frequency distribution of anticipated most probable corn prices (\$1.00) was below the cash price of corn at the time the interviews were made. Also some farmers' anticipated most probable prices were below the "support price" for corn—a support price to which the government was committed through December, 1948. The mode of the frequency distribution of most probable soybean prices was also below the March, 1947, cash price.

These expectations were consistent with the expectations regarding movements in the general level of farm prices. The farmers in this sample were generally pessimistic regarding the movement of farm prices between March and December of 1947, only 8 of the 54 farmers interviewed believing that a given farm price index would be as high in December, 1947, as in March, 1947, the remainder believing that the index would be lower.

In addition to the anticipated most probable prices for December, 1947, each interviewee was asked what he thought was the proba-

bility that the price would be either as much as 25 cents above or below the most probable price—i.e., the interviewee was asked to specify his estimate of the probability that the price would lie within a given 50-cent range. One could not ascertain from the interviews whether a very high percentage of the interviewees had ever formulated their anticipations in terms of probabilities. Consequently, the answers to this question may not be very meaningful as a clue to the nature of expectations.³ The frequency distribution of the probabilities that the December price would lie within this 50-cent range is indicated in table 2.

TABLE 2. FREQUENCY DISTRIBUTIONS OF ANTICIPATED PROBABILITIES THAT DECEMBER, 1947 PRICES WOULD FALL WITHIN THE RANGE OF 25 CENTS ABOVE OR BELOW THE ANTICIPATED MOST PROBABLE PRICE

CORN PRICES				SOYBEAN PRICES			
Probability		Frequency		Probability		Frequency	
		Number	Percent			Number	Percent
1.0		6	12	1.0		1	2
.9		14	29	.9		9	21
.8		11	23	.8		10	24
.7		1	2	.7		4	10
.6		1	2	.6		4	10
.5		12	25	.5		12	29
.4		1	2	.4		2	4
.1		2	5	does not know		12	—
does not know		6	—			54	100
		54	100				
Mean (48 observations) 0.73				Mean (42 observations) 0.69			

Additional information relating to price anticipations was obtained through questions designed to determine the symmetry of the distributions. Each farmer was asked whether he thought that a realized price higher than the anticipated most probable price was more likely, equally likely, or less likely than a realized price lower than the anticipated most probable price. Similarly, each interviewee was asked whether a realized price as high as 25 cents above the anticipated most probable price was more likely, equally likely, or less likely than a price as low as 25 cents below

³ It is interesting to note that some of the interviewees were asked to specify their estimates of the probability that the price would fall outside the 50-cent range and that these answers were not always consistent, i.e., the sum of the two probabilities were not always equal to unity.

the anticipated most probable price. Replies to these questions are summarized in tables 3 and 4.

TABLE 3. DISTRIBUTION OF REPLIES TO QUESTION RELATING TO PROBABILITY OF A REALIZED PRICE IN EXCESS OF ANTICIPATED MOST PROBABLE PRICE AS COMPARED WITH A REALIZED PRICE BELOW ANTICIPATED MOST PROBABLE PRICE

	Corn		Soybeans	
	<i>Number</i>	<i>Percent</i>	<i>Number</i>	<i>Percent</i>
just as likely	13	25	12	27
more likely	18	35	17	39
less likely	21	40	15	34
does not know	2	—	10	—
	54	100	54	100

TABLE 4. DISTRIBUTION OF REPLIES TO QUESTIONS RELATING TO PROBABILITIES OF A REALIZED PRICE AS MUCH AS 25 CENTS ABOVE ANTICIPATED MOST PROBABLE PRICE AS COMPARED WITH A REALIZED PRICE AS MUCH AS 25 CENTS BELOW ANTICIPATED MOST PROBABLE PRICE

	Corn		Soybeans	
	<i>Number</i>	<i>Percent</i>	<i>Number</i>	<i>Percent</i>
just as likely	10	20	5	13
more likely	23	45	20	51
less likely	18	35	14	36
	51	100	39	100
does not know	3	—	15	—

Plans

An important aspect of the study of anticipations is the manner in which they are incorporated into plans. Such an investigation must take cognizance of the basic motivating factors in planning—the objectives which the farm operator is attempting to achieve. This area was not thoroughly probed by this study. However, an attempt was made to gain some insight into the importance of various economic and technological elements in conditioning plans. The framers were quizzed regarding differences between their 1946 acreages of corn, soybeans and oats and their 1947 plans for these crops. The planned changes are summarized in table 5, and a classification of the stated reasons for change is presented in table 6.

The magnitude of the changes was not determined so that relatively small changes are weighted equally with relatively large

changes in this summary. Of significance for further investigation is the apparent importance of technological rather than market considerations in accounting for the frequency of changes over time. Although one cannot assign probabilities to generalizations made from these observations, they check with the relative year to year insensitivity of crop acreages to relative prices for the U. S. as a whole.⁴ The importance of technological considerations is also

TABLE 5. NUMBER OF INDIVIDUALS PLANNING A CHANGE IN CERTAIN ACREAGES IN 1947 AS AGAINST 1946

	No. plan- ing an increase		No. plan- ing an decrease		No. plan- ing no change		Unclassi- fied*
	Num- ber	Per- cent	Num- ber	Per- cent	Num- ber	Per- cent	
Acreage in corn	24	47	15	29	12	24	3
Acreage in soybeans	21	41	3	6	27	53	3
Acreage in oats	11	22	26	51	14	27	3

* Includes operators who were farming totally different land in 1947 than in 1946.

TABLE 6 OPERATOR'S REASONS FOR PLANNING CHANGES IN CROP ACREAGES IN 1947 AS AGAINST 1946

Reason stated	Number of individuals	Percent of positive statements
Unclassified*	3	
No reasons stated**	7	
	—	
	10	
Last minute contingencies of weather	3	7
Consideration of feed and livestock requirements	9	20
Considerations of price and anticipated profitability	13	30
Soil-improvement and rotational influence	19	43
	—	—
	44	100

* Includes operators who were farming totally different acreages in 1947 than in 1946.

** Includes operators who were not planning a change in any crop acreage.

suggested by the fact that 50 of the farmers had their spring crop plans outlined in the fall (four to six months in advance of the dates of execution) and only 10 indicated that any changes in plans had been made during the winter, five indicating revisions due to ex-

⁴ Refer to T. W. Schultz, "The Economic Stability of American Agriculture"; *Journal of Farm Economics*, XXIX: pp. 809-26.

pected changes in relative prices. The accuracy of answers to these questions regarding changes in plans cannot be checked since the initial plan was not observed. However, these answers suggest considerable inflexibility in changing plans in response to anticipated price changes. Additional support for this hypothesis is suggested in the replies to a question regarding reactions to a postulated 20 percent increase in the anticipated most probable price of corn. Only 2 farmers indicated that they would expand corn acreage. While these answers are hypothetical responses to purely hypothetical situations and should not be interpreted as the way in which all of these farmers would have responded to actual situations, they suggest not only inflexibility in plans but also a considerable lack of confidence in the anticipations which were formed.

*Reasons for Inflexibility in Response to
Anticipated Price Changes*

Questions relating to yield expectations were also included in this survey. The interviewees were asked to specify the average corn and soybean yields which they expected over the five-year period, 1947-51. The average expected yields for all farmers answering the question were almost identical with the average yields which they thought had prevailed during the previous five years. Although a previous study indicates important memory errors in reporting past yields,⁵ these errors are unimportant in formulating a yield "forecast equation" for the aggregate of farmers as long as the nature of the errors is known.

Not all farmers expected yields during the subsequent five years to average the same as during the previous five years. Anticipated improvements in soil fertility and cultivation was given most frequently as a reason for an increase in the anticipated average future corn yield, while unfavorable weather was most frequently presented as the factor expected to be responsible for a reduction in the average future yield.

An attempt to measure the uncertainty attached to corn yield expectations was made through questions relating to the probability that the yield during any single year in the five-year period in the future would fall as low as 20 bushels below the expected average

⁵ Refer to O. H. Brownlee, "Memory Errors as They Affect Survey Data," *Journal of Farm Economics*, XXII (May, 1940).

yield or would rise as high as 20 bushels above the expected average yield. Replies to these questions are summarized in table 7.

Although not enough questions were asked regarding crop yield expectations to permit an accurate formulation of the degree of uncertainty attached to these expectations, it appears likely that less uncertainty is attached to them than to price expectations. For example, the anticipated average of yields over 10 years in

TABLE 7

Situation	No. of Replies
(1) Yield in any one year <i>more likely</i> to exceed most probable anticipated value than to fall below it.	22
(2) Yield in any one year <i>less likely</i> to exceed most probable anticipated value than to fall below it.	13
(3) Yield in any one year <i>equally likely</i> to exceed most probable anticipated value as to fall below.	11
(4) No reply	8
Total	54

the future probably is expected with considerable confidence (i.e., the expected probability of a large departure of the realized average from the anticipated average is small).⁶ Interviewees hardly would hazard a guess regarding the average ratio of corn and oats prices or corn and soybeans prices over a 10-year period in the future. A higher degree of confidence in anticipations regarding technological factors than in anticipations regarding prices may be important in the apparent overweighting of technological considerations in planning.

In addition to the degree of uncertainty attached to anticipations, the preferences of the farmers for greater certainty should be known before we can evaluate the importance of uncertainty in planning. Lange⁷ and Makower and Marshak⁸ have suggested that different probability distributions of anticipated values might give rise to the same plan. For example, sellers might respond in the same man-

⁶ Questions relating to this aspect of the problem were asked during the initial interviews but were deleted.

⁷ Oscar Lange, *Price Flexibility and Employment*, Bloomington: The Principia Press, Inc., 1944, pp. 30-31.

⁸ H. Makower and J. Marshak, "Assets, Prices and Monetary Theory," *Economica* (N. S.), Vol. V. pp. 261-88 (August, 1938).

ner to a distribution with a given anticipated most probable price and a given dispersion as they would to another distribution with a higher anticipated most probable price and a higher dispersion. The relationships between these various distributions would describe the aversion to uncertainty. It is with reference to this hypothesis that the questions relating to uncertainty preferences were based.

Each farmer was asked to imagine that some agency offered to purchase in March, 1947, all of his prospective corn and soybean crop for delivery in December, 1947. He was then asked to state what price he would have to receive in order to close such a deal. These answers were then compared with the anticipated most probable prices and degrees of uncertainty which each individual had registered earlier as his estimate of future conditions.

That the situation presented to them was purely hypothetical was obvious to most of the farmers interviewed. In fact more than one-third of the interviewees either refused to answer the question or stated that they would not accept a contract at any price. Nearly all of the farmers answering the question, however, indicated a preference for uncertainty. This result is somewhat surprising. The replies to the questions relating to uncertainty preferences are summarized in table 8.

TABLE 8

	Corn		Soybeans	
	<i>Number</i>	<i>Percent</i>	<i>Number</i>	<i>Percent</i>
Present 'asked' price lower than modal price anticipation	1	2	3	7
Present 'asked' price higher than modal price anticipation	25	51	19	44
Present 'asked' price about the same as modal price anticipation	6	12	4	9
No contract under any conditions	17	35	17	40
	49	100	43	100
Does not know	5		11	
	54		54	

Suggestions for Further Research

Except for the absence of "forecast equations" relating to price expectations, an experiment of this type is complete in the sense that it describes anticipations and plans and their interrelationships

at one point in time. Such an experiment is incomplete in that it has not traced the divergences between the plans that were actually effected and those stated by the interviewees. Nor has it noted the manner in which the plans were unrealized and the revisions in anticipations and plans which grow out of the divergences between anticipated and realized values. Also in this particular experiment the farmers were not probed sufficiently to permit a detailed description of the uncertainty attached to anticipations or a complete description of uncertainty preferences.

Any importance which might be attached to this study lies not in the estimates of various coefficients which might be computed from the data which were collected but in the hypotheses which are suggested for testing in subsequent studies and the methods which might be employed in collecting the information. Among the hypotheses which are suggested for investigation in future research along similar lines are:

1. That technological uncertainty is considerably less than price uncertainty and that consequently farmers weight more heavily than appears rational technological considerations in formulating their production plans.
2. That most farmers are unaware of the existing institutions for reducing price uncertainty (the commodity futures markets, for example) and might make use of these institutions if the implications were clearly set forth for them.
3. That firms do not conceive uncertainty in terms of a probability distribution (or probability distributions) of anticipated values. If this hypothesis were confirmed it would necessitate discarding a part of the model used in this analysis.

Among the suggested procedures for further research along similar lines are:

1. Periodic interviewing of a selected group of farmers to note the manner in which plans are formulated, revised and finally translated into action. Such periodic contacts with the farmers might also permit a formulation of the way in which anticipations are formed.
2. Minimization of the number of questions relating to hypothetical reactions to hypothetical situations. Such questions cannot be completely eliminated if adequate notions regarding uncertainty and reactions to uncertainty are to be obtained. However, it must be recognized that the replies given to such questions do not accurately describe the responses which would in fact occur if the hypothetical situation actually faced the farmer.

JAPAN: THE RACE BETWEEN FOOD AND POPULATION

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RECENT events in the Far East have once again brought the occupation of Japan to the attention of the American public. The imminent conquest of the Asiatic mainland by China's Communists has compelled observers of Far Eastern affairs to ponder the significance of the swift turn of events in China upon the Allied occupation of Japan. The general elections held in Japan in January of this year have attracted considerable attention because of the surprising strength shown by the Japanese Communists. While Communist domination of certain strategic labor unions has been an acknowledged fact, the Communist party had been regarded as a negligible force in the general political arena. Their capture of over 10 percent of the popular vote is reported to have surprised even the Communist leaders, and the significance of that spurt of popularity should not be overlooked.

The recent visit to Japan by ex-Secretary of the Army Royall has also tended to focus attention upon problems of occupation policy in the Pacific. In particular, statements alleged to have been made by him in his "secret" press conference in Tokyo seem to suggest uncertainty in United States policy toward Japan. Despite ex-Secretary Royall's disclaimer, the press dispatches were consistent in reporting that he raised the question whether the United States would attempt to defend Japan and utilize it as a base in the event of war with Russia. His reported comments seem to indicate that he is inclined to regard Japan as a potential military liability, and the defense of Japan as a responsibility which the United States should not undertake. He appeared to be particularly concerned about the problems of feeding Japan's 80 million people and maintaining a flow of raw materials for her factories under wartime conditions—problems which would be of decisive importance if Japan were to be utilized as a strategic base.¹

¹ In *San Francisco Chronicle*, Feb. 17, 1949 *cf.*: United Press dispatch, Washington, D. C., Feb. 16, p. 1; Peter Kalischer, United Press dispatch, Tokyo, Feb. 17, p. 2; Russell Brines, Associated Press dispatch, Tokyo, Feb. 17, p. 2. The Brines article stresses the fact that ex-Secretary Royall was speaking hypothetically, but his report confirms Kalischer in all of the important points.

The problem of United States withdrawal from Japan in the event of war with Russia—or in anticipation of such a war—is highly complex and involves an important moral issue as well as problems of logistics and military strategy. On the moral issue, one group takes the position that the United States is obligated to provide protection for a defenseless Japan while the opposing group believes that the demilitarization of Japan by the United States has not created any obligation to defend Japan. Fortunately, these questions are merely hypothetical at present, but it seems likely that predilections regarding Japan's strategic value in the event of war and views on the degree of United States responsibility to defend Japan will influence policies with regard to American assistance to promote Japan's economic recovery.

Apart from the question of her potential strategic importance in the event of war, Japan stands now as the most important testing ground in the Far East in the ideological and political conflict between Soviet Communism and the doctrines of liberty and constitutional government represented by the United States and Western Europe. Here again the problems of food and population are of fundamental importance. Just as the logistic problem of feeding Japan's population is recognized as a major problem in the event of war, the economic problem of securing an adequate food supply is of crucial importance to Japan in time of peace.

With a population which has now reached 81 million and a total land area slightly smaller than the State of California, the existence of a food deficit in Japan can be readily understood. Intensive cultivation of the available land and the heavy application of fertilizers are responsible for crop yields per acre among the highest in the world. In spite of the long-standing intensive efforts to maximize Japan's production of home-grown food, it was necessary before the war to supplement domestic production with food imports which averaged well over three million tons annually.

During the past three years food imports have been at about 60 percent of the prewar volume, and this reduction of imports in the face of a sharp increase in population has made it necessary to continue a strict program of food collections and rationing. Notwithstanding the restricted level of imports and food consumption, the food-import bill is averaging \$250,000,000 a year; imports of fertilizer to sustain Japan's agricultural production, and petroleum products for the fishing fleet and other uses amount to an additional

\$75,000,000 annually. These are facts of considerable importance to the American taxpayer. With a negligible volume of exports, Japan has had no financial resources with which to pay for these relief supplies. In accordance partly with obligations of international law, but also for humanitarian and practical reasons, it has been necessary for the United States to provide Japan with imports of food, fertilizer, and other supplies required "to prevent starvation, disease, or unrest."

Very little has been accomplished to date in enhancing Japan's ability to pay her own way in financing necessary imports by sales of Japanese exports in world markets. It is generally recognized that the importation of key industrial raw materials is a prerequisite for any significant increase in the volume of Japanese exports. Relief appropriations for Japan have approximated \$400,000,000 a year, but nearly all of this money has been required for food and other supplies needed to maintain the civilian population. The need for a longer-range program to facilitate raw-material imports of textile fibers, iron ore, and a host of other materials required to expand industrial production and the volume of exports has been widely recognized.

In the fall of 1947 a program for Japan's economic recovery was prepared by "SCAP"—General MacArthur's headquarters as Supreme Commander for the Allied Powers. In April 1948, a committee which included Percy H. Johnston as chairman, Paul G. Hoffman, Undersecretary of the Army William Draper, Robert F. Loree, and Sidney H. Scheuer surveyed the economic situation in Japan and recommended Congressional approval of a program to promote economic recovery in Japan and Korea by providing funds needed to restore the flow of raw-material imports.² Instead of voting funds for the economic-recovery budget presented by the Department of the Army, the Congress broadened the language of the GARIOA³ relief budget to permit the use of these "disease and unrest" funds to promote economic recovery and the total appropriation for Japan, Germany, and Korea was increased from 1.25 billion to 1.3 billion dollars. By adjusting allocations between areas the Department of the Army has been able

² Percy H. Johnston, Paul G. Hoffman, Robert F. Loree, Sidney H. Scheuer, *Report on the Economic Position and Prospects of Japan and Korea* . . . (Secretary of the Army's Committee to Inquire into Economic Problems of Japan and Korea, April 26, 1948, mimeographed).

³ Government and Relief in Occupied Areas.

to allot something over 50 million dollars to finance raw-material imports to Japan during the current fiscal year. The prospects for appropriated funds to finance imports of industrial raw materials during the fiscal year beginning next July are obscure at this time, but it is probable that there will be an increase over the current fiscal year in order to support a more rapid expansion of the volume of exports.

The occupation in Japan has represented a bold experiment in seeking to redirect the thinking and activity of the Japanese people along democratic and peaceful lines. It is premature to draw any confident conclusions concerning the long-term success or failure in achieving the positive objectives of the occupation. Nearly all serious observers of the Japanese occupation agree, however, that gratifying progress has been made to date. The demilitarization of the home islands—the negative phase of the occupation—was carried out with dispatch. A liberal constitution has been adopted and the Japanese people are making strides in governing themselves by democratic institutions and procedures. The cult of State Shinto, which fostered a fanatic nationalism and supported Japan's military aggression, has been rooted out. Major reforms have been introduced in education and other fields to promote ideas and beliefs required to establish a democratic society in place of the feudalistic Japan which plotted and waged the recent Pacific war.

Although the results of the first three years offer considerable hope for a successful outcome, it will be years before the newly established democratic institutions and practices take firm root. In the meantime, Japan's fledgling democracy must face the possibility either of a resurgence of the reactionary, militarist groups, or of domination by the ambitious Communist party. In the present world situation it is probable that the Communist threat is the more serious, and as usual the existence of prolonged economic hardship will be a potent ally of Communism. If Japan's new democratic government coincides for a prolonged period with economic instability and severe hardship, it will encounter great difficulty in winning a genuine acceptance in the minds of the Japanese people. The supply of food will be the most basic factor influencing the standard of living of the average Japanese family; and the prospective food supply depends in turn upon the prospects for increasing home-grown food production, the possibilities for

securing additional food by trade, and the relations between future population growth and the supply of food. Regardless of any shifts in American occupation policy, those three elements—food production, trade, and population—will be basic factors underlying economic and political developments in Japan.

Pre-War Food and Population Balance

It is not surprising that the economic history of Japan in the modern era has been dominated by problems of food and population. In any country the supply of food is a major factor in determining the standard of living of the people. In Japan there is a very apparent tendency for the average person to identify his general well-being with the supply of food, and especially with the supply of rice. The special significance of rice, the staple food of the Japanese diet, is vividly portrayed in a rough translation from a history of Japanese food and agriculture: "When people talked of food problems in Japan, it was nothing but rice problem. There has been no greater suffering to Japanese than the absence of rice to eat on the morrow. Moreover, the rice must be 'Japanese rice' (indigenous species), as a proof of which formerly foreign rice [imported from countries other than the former Japanese colonies of Korea and Formosa] was commonly called 'China rice,' and in spite of its cheap price, those who purchased it were ashamed to be seen, being taken as lower classes, or it was propagated with exaggeration that those who consumed it would have disorderly bowels or diarrhea."

The preference of the Japanese people for rice is still a factor to be reckoned with, but the far more basic problem at the present time is maintaining a supply of food—regardless of kind or taste preference—which will provide sufficient energy for an efficient working population. The direct relationship between adequate food energy and economic recovery is obvious, but the indirect relationship in terms of inflationary pressures and instability stemming from an acute food shortage is probably of even greater significance. Inasmuch as a reasonably adequate supply of food can only be secured by supplementing indigenous production with imports, it is clear that the attainment of economic selfsupport—with exports sufficient to cover the cost of necessary imports—is intimately related to the problems of food and population.

The period since Japan emerged from isolation and embarked

upon industrialization and international commerce has been marked by an enormous increase in population—from a level of 30–35 million in the three centuries preceding 1868 to 81 million at the present time. The population is currently increasing at the rate of 1.3 to 1.4 million persons per year. The sharp increase in population during the modern era has been due to reductions in the death rate while the birth rate remained high. The introduction of medical science, improved knowledge of personal hygiene and public health, and economic advances resulting from industrialization brought about a sharp reduction in infant mortality rates and lowered the death toll due to disease and epidemics. This pattern will be recognized as essentially the same course which characterized population growth in Western Europe and America with the industrialization of the nineteenth century.

Unless some unexpected change occurs in the birth rate or death rate, it is anticipated that Japan's population will increase to about 87 million by 1953. If approximately the same rate of annual increase should continue, the population would reach nearly 100 million by 1960. Two factors will be decisive in determining whether the actual increase will be as great as these projections: first, the extent to which the death rate is controlled; and secondly, the extent to which the birth rate is left uncontrolled.

In the two decades between the first and second World Wars, there was evidence of a decline in the rate of growth of the Japanese population. Total population continued to increase rapidly during those years, but fertility rates among women of child-bearing age showed a moderate downward trend. It seems reasonably certain that this declining tendency of the birth rate is evidence that some knowledge of birth control was available and practiced. The return to Japan of several million demobilized servicemen after the surrender was followed by an abnormal increase in births which makes it difficult to discern the present trend of the birth rate. It appears that knowledge of birth control has not yet become general, and consequently the practice of birth control in the years ahead will depend to a very considerable degree on action which is (or is not) taken to promote wider knowledge of birth control methods.

In the years prior to the War Japan's problem of securing an adequate supply of food for her growing population was a public issue of the first magnitude. Emphasis was initially placed upon

measures to increase production of home-grown food. The most important gains in domestic food production were achieved through marked increase in crop yields per acre of cultivated land. Scientific improvements in the fields of plant breeding and seed selection, expansion of irrigation and drainage facilities, and the increased use of chemical fertilizers made notable contributions to increasing the yields per acre and to reducing vulnerability of crops to damage from disease, insects, drought, and floods. The most conspicuous gains were achieved in rice, which showed an increase of over 100 percent in the average yield per acre between 1878 and 1937. Some increase in production was also brought about through expansion of crop acreage which increased some 40 percent in the same 60 year period. Possibilities for increasing acreage were limited, however, and the increase in the 20 years preceding 1937 was less than 5 percent.

Beginning with World War I there was an increasing reliance upon food imports to fill the deficit which occurred as population growth outstripped the increase in home-grown food supply. With the growing need for food imports systematic programs were instituted in Korea and Formosa, Japan's former colonies, to develop those areas as Japan's primary and assured sources of food supply. Comprehensive, effective, and in many instances high-handed measures were carried out to increase the production of rice in Korea and of rice and sugar in Formosa. This program even went to the extent of requiring Korean and Formosan farmers to shift from their traditional seed to Japanese varieties of rice. Practices in land tenure, such as the collection of heavy land rents in kind—sometimes equalling 50 to 75 percent of the crop—were encouraged in order to insure that the largest possible percentage of the colonial output would be exported to Japan. Particularly in Korea the increase in exports of rice was considerably greater than the increase in production. The increase in exports to Japan was realized at the expense of a material reduction in the domestic consumption of rice in Korea which was partially made up by increased consumption of cheaper millets and sorghums.

From the Japanese viewpoint a fairly satisfactory solution of the food problem was achieved in the years prior to the outbreak of the War. In the 1930's rice imports of 1½–2 million tons (virtually all of it from Korea and Formosa) were added to the indigenous production of 9–10 million tons of rice. This sufficed to provide an

ample supply of rice, and in the early 1930's actually contributed to a problem of surplus and depressed agricultural prices. In addition to the rice imports, nearly a million tons of sugar a year was imported from Formosa, and soybean imports from Manchuria of some 600,000 tons annually provided an important protein supplement in the Japanese diet. The typical diet was somewhat inadequate from a nutritional standpoint because it contained too much starch, too little animal protein, and was characterized by certain vitamin and mineral deficiencies. Nevertheless the food supply provided sufficient energy for an active population at a cost which was not burdensome, and hunger was felt by only a small percentage of the population.

Occupation Food Policies

During the period of the occupation, food imports to Japan have been restricted by the world food shortage and the fact that the funds provided for this purpose by Congress were calculated on the basis of imports required to maintain a ration level sufficient only to prevent "disease and unrest." In November 1948, the ration level was increased from 1300 to 1440 calories for "normal consumers" with corresponding increases for other ration categories. This increase represented an important part of the current program to enlarge industrial production and expand Japanese exports in order to enhance Japan's ability to foot the bill herself in financing necessary imports.

The food rationing program in Japan is extremely comprehensive. It encompasses all the grains, potatoes, sugar, edible oil, and soybean products. Together these items comprise some 85-90 percent of the calories in the Japanese diet. Even fish (the most important source of animal protein) and vegetables are rationed in the larger cities in spite of technical difficulties occasioned by their perishability, seasonal variations in supply, and other factors.

Although rationed foods have been made available at prices well within the reach of the average consumer, the purchase of supplementary food on the blackmarket at exorbitant prices has had an extremely inflationary effect on the cost of living. At least until the increase in the ration from 1300 to 1440 calories, it was a matter of necessity, not luxury, for most consumers to obtain additional food energy from rice, potatoes, and other staple foods purchased on the blackmarket. The food which finds its way into the black-

market is lured away from the farms, in part as a reduction of the farmer's own consumption level, by blackmarket prices as much as ten to twenty-five times the official price. The inflationary impact of blackmarket food purchases at such prices is obvious and is largely responsible for the fact that food represents approximately two-thirds of the total cost of living of urban consumers. The high and steadily rising cost of food has been a major factor underlying the wage-price spiral which has created the dangerous inflationary situation in Japan today.

During 1948 there was moderate improvement in living standards and a slowing down of the rate of inflation. More regular distribution of the basic food ration and larger supplies of vegetables and fish have been important factors contributing to this improvement. It can also be expected that the recent increase in the food ration will result in some further improvement in the situation. It should be stressed, however, that even with this recent improvement in living levels, consumption of the two most basic ingredients—food and textiles—is still meagre and below prewar levels. Inflation continues to create serious economic hardship for the average Japanese and to hamper efforts to increase production and exports.

It must further be borne in mind that economic gains thus far have been possible only because United States funds appropriated for food and other relief supplies have offset the deficit between the cost of Japan's imports and the income from her exports. Needless to say, that highly abnormal situation must be brought to an end as early as practicable, and Japan's economy cannot be regarded as stable until such time as she has regained a balance in her international payments.

Foreign Trade Expansion Possibilities

In the years ahead the adequacy of Japan's food supply will be determined primarily by the degree of success achieved in expanding foreign trade. It is generally agreed that home-grown food production cannot be expanded to the point of complete self-sufficiency. Despite the high priority now being given to land reclamation and other measures to increase food production, it seems certain that the increase in population will more than offset the prospective increase in food supply—barring some revolutionary and unforeseen improvement in agricultural technique. Without the possibility of augmenting domestic supplies with imported food, Japan would

be faced indefinitely with an almost hopeless problem of overpopulation.

In the future as in the past, if sufficient foreign exchange can be obtained through export sales to pay for required imports, the deficiency in home-grown food can be offset by food imports. Unless we assume a world of economic "autarky" with rigid trade barriers and extreme emphasis on national self-sufficiency, dependence upon food imports is not necessarily an undesirable condition. England, whose economic problems parallel those of Japan in many important respects, adopted policies in the last century which increased her reliance on imported food because it was considered advantageous to promote trade and industry even though domestic agriculture was expected to suffer from the freer flow of international commerce.

The question of Japan's ability to finance adequate food imports in the future is an integral part of the broader problem of when and how Japan can become economically self-supporting. Although a detailed analysis of prospects for trade expansion and achieving a balance of international payments is beyond the scope of this article, it is necessary to consider a few of the highlights of that problem. Since the future food supply position will be determined primarily by the level at which a balance of payments is achieved, the nature of the outlook for a successful revival of trade is of crucial importance in evaluating policies with respect to food and population.

The basic weaknesses in Japan's foreign trade position are well known. The dearth of natural resources available in Japan aggravates the foreign trade problem, since nearly all of the important export products depend entirely or in part on imported raw materials. Silk, marine products, tea and a few minor items such as peppermint and pyrethrum complete the list of exports which can be produced from Japan's indigenous resources. Textile exports are the mainstay of Japan's foreign trade, but apart from silk her textile production depends almost entirely on imported raw materials. Machinery products, which are counted upon as the major field for export expansion, depend upon imports of high-grade iron ore, coking coal, and other raw materials. Foreign exchange funds must therefore be earned not only to pay for imports of food and other commodities required to meet Japan's needs for domestic consumption, but also to finance costly imports of raw cotton, iron

ore, and other commodities required as raw materials for her export industries. Food imports of roughly half a billion dollars (at current prices) would be needed to provide a food supply approaching prewar levels, but it is estimated that a balanced international trade which would permit food imports of that magnitude would also involve imports of industrial raw materials and a multitude of other products which in total would amount to another billion dollars of imports a year. Thus exports would have to reach a level of about a billion and a half dollars annually for Japan to attain self-support at a level which would approximate prewar living standards.

Despite the problems involved, Japan in prewar years actually achieved a balance of international trade which provided a fairly adequate food supply and a tolerable level of living. The postwar situation is characterized, however, by certain special factors which bode ill for Japan's foreign trade in the years ahead. These factors include the economic dislocations associated with war which are familiar to the American public because they are so pertinent to the Marshall Plan for European recovery. The problems of war damage and obsolete equipment, low levels of industrial production, depleted working capital, plant operation at a fraction of capacity levels, and high costs of production are all important features of the economic scene in Japan today.

There is reason to believe, however, that the problems of production will be much more susceptible of solution than those which affect so adversely Japan's foreign trade prospects in Asia. The highly unstable political, economic, and military situation in China, Indonesia, French Indo-China, and to a lesser extent Burma, is of the greatest significance to Japan. The Far East is by logic and economics the major source of supply for imports to Japan and the best market for Japanese exports. A closely related consideration is the fact that Korea, Formosa, and Manchuria are no longer in the picture as major sources of food supply. Recently Formosan sugar has been purchased for Japan, but apart from sugar from Formosa those three areas cannot be considered as potential sources of food imports for Japan. (Korea may possibly resume rice exports on a limited scale in a year or two, but population, political, and economic factors make it improbable that Korea will again become a major source of food supply for Japan.) The other major food exporters of Asia—Burma, Siam, and French Indo-China—are

only gradually approaching their prewar volume of exports and cannot be expected to make a very large contribution to filling the gap resulting from the elimination of Korea, Formosa, and Manchuria as sources of supply. For several years at least, Japan must continue to rely in large measure upon food imports from the United States.

Importation of wheat from the United States in lieu of rice from Asia raises a number of problems. The preference of the Japanese for rice can conveniently be omitted from discussion, because it is quite possible that in the long run that factor would be offset by the lower cost of wheat as compared with rice. The major significance of the reliance on grain imports from the United States is that the necessity to make substantial dollar purchases of food aggravates the problem of securing a balance of dollar payments which promises to be the most difficult aspect of the overall problem of securing a balance of international payments. In former years when international trade was more characteristically a multilateral affair, the problem of maintaining a balance of trade between two particular countries or two particular currencies was of no great significance. At the present time, however, when trade restrictions and nonconvertibility of currencies are the order of the day, the problem of securing a balance of dollar payments is of major importance. The restricted opportunities for exporting Japanese products to the United States to offset the cost of purchases of food and raw cotton in this country will make the solution of that problem extremely difficult. In prewar years Japan's purchases of raw cotton in the United States, which averaged \$166,000,000 annually (1930-34), were offset in large measure by raw silk sales to the United States of about \$135,000,000 a year. The preference of the American woman for nylon stockings has reduced the market for raw silk exports to a fraction of the prewar volume and is another significant factor aggravating Japan's dollar problem.

The dollar problem is only one aspect of the way in which governmental controls on foreign trade can be expected, for some years at least, to have a generally restrictive effect on the expansion of foreign commerce which in the case of Japan will enhance the difficulty of attaining a self-supporting status. Restrictive regulations such as exchange controls, export and import quotas, limitations on private trading and other characteristic features of international trade thus far in the postwar era have increased greatly the com-

plexity of carrying on trade and have been responsible for the failure to develop numerous potentialities for trade. These features have characterized the trade of England and the other countries of the Sterling Bloc, and they have been an even more conspicuous feature of foreign trade in Japan itself.

Foreign trade, like all other aspects of Japan's international relations, is under the control of "SCAP"—General MacArthur's headquarters as Supreme Commander for the Allied Powers. In the initial stages of the occupation no other course was possible. Although many restrictions have since been removed, foreign trade is still essentially a SCAP-controlled operation. In the absence of a foreign exchange rate for the Japanese yen and with SCAP in the position of being responsible for insuring that United States funds are utilized as effectively as possible, this is wholly as would be expected. Furthermore, the economic dislocations involved in the present situation make inevitable a considerable measure of government control. Nevertheless it cannot be denied that the red-tape of a "double bureaucracy"—SCAP and the Japanese Government—tends to retard the development of trade.

There are additional unfavorable factors in the postwar situation which are related directly to Japan's defeat. The destruction of her merchant marine during the War has changed Japan from a maritime nation of the first order to a country which relies almost entirely on foreign vessels to carry her exports and imports. An invisible export of considerable magnitude in prewar years has thus been converted to a charge of some \$60,000,000 annually for shipping services which must be paid in dollars or other foreign currency. A somewhat related problem is the restriction of the areas in which Japan is permitted to fish, for reasons of security as well as the objections of the countries concerned to having Japanese fishermen enter the waters adjacent to their shores. The prohibited waters include the Kamchatka crab fisheries offshore from Soviet Siberia and the bonito and tuna fisheries of the central Pacific. The fisheries centered in those two areas were the source of a major part of the high-grade marine products which formerly provided Japan with a highly profitable export. Limitations imposed on travel and foreign residence of Japanese businessmen constitute another restriction upon the development of trade. The job of promoting sales of a host of export items ranging from rice bowls to cameras and electric refrigerators is an operation which does not

lend itself to trade negotiation by remote control, and the lack of qualified salesmen on the spot has unquestionably had a deterrent effect on the sales of many export products.

Population Growth Aggravates Problem

It is clear that a satisfactory solution of Japan's food problem will be impossible without a substantial trade recovery including an increase of exports to seven or eight times the present level. Careful consideration of the problems involved in Japan's trade recovery leads unavoidably to the conclusion that the solution of these problems will be extremely difficult under present conditions. An analysis of the underlying problems of increasing industrial production, financing raw material imports, replenishing working capital, and finding markets for the increased volume of export manufactures indicates that the attainment of economic self-support will probably not be possible before 1953, and the balance of payments envisaged for 1953 involves a level of living considerably below the prewar. Continued economic assistance from the United States will be necessary for several years, and it is essential that this aid include funds for recovery purposes as well as for relief items such as food and fertilizer. Such aid is indispensable if the production-export cycle is to receive the impetus necessary to move the Japanese economy off "dead center" so trade can reach a level where Japan will be able to pay for the imports which she requires. Failure to achieve the economic and trade recovery needed to support a tolerable level of living would provide the subversive elements in Japan—of the extreme left and the extreme right—with a rich opportunity to gain strength and jeopardize the prospects for a successful occupation. The success or failure of the occupation effort in Japan is of such importance in the ideological struggle against communism in Asia that American assistance in stimulating economic recovery and the attainment of a self-supporting status appears to be eminently desirable regardless of opinions concerning the strategic value of Japan in a possible war with Russia. Not only is economic recovery and self-sufficiency essential to the material well-being and self-respect of the Japanese people, but it is also the only acceptable method for ending the present anomalous situation in which American taxpayers are spending approximately \$400,000,000 a year in relief appropriations for Japan.

Japan's dependence upon imported foodstuffs highlights the urgent need for wise action to invigorate and enlarge her foreign trade. While this course offers the main hope for solving Japan's economic problems, the expansion of trade is now confronted with such grave difficulties that it is advisable to direct attention also upon measures which will lessen the magnitude of the foreign trade problem by enabling Japan to balance exports at a lower level if necessary. Food and population are the critical elements in any measures to lessen Japan's dependence upon the success of her efforts to expand foreign trade. An increase in indigenous food production and a reduction in the rate of population increase would permit the attainment of a fairly adequate standard of living at a lower level of foreign trade, and thus make Japan less vulnerable if she fails to achieve a satisfactory trade recovery. Measures to increase the production of home-grown food are already receiving a high priority, and ambitious programs to reclaim land for agriculture and to improve land now under cultivation by irrigation and drainage are in progress. On the basis of present projections of population growth the effect of these programs to expand food production would, however, be nullified completely by the increased number of mouths to be fed.

To a limited extent knowledge of birth control already exists and is being practiced in Japan, and a few groups are actively concerned with the question. The majority of people, however, appear to be either unwilling to face the problem or unaware of the questions of public policy involved in the dissemination of information on birth control methods. There is considerable speculation in the Japanese press about the possibility of relieving Japan's population by migration, whereas the question of birth control receives comparatively little attention.⁴ The discussion of migration almost appears to be a smoke screen to divert attention from the more realistic possibilities which exist in the wider application of birth control. A realistic appraisal of the present world political situation indicates that at the present time the prospects for large scale migration of population from Japan are negligible. The prospects were not good ten or fifteen years ago, and the hostility engendered in other countries of the Far East by Japan's military

⁴ The establishment of a Japanese population research institute and Dr. Warren Thompson's recent visit to Japan give promise of increasing attention to the problem of birth control.

conquests makes it most unlikely that any of the sparsely populated areas will open their doors to Japanese migration in the foreseeable future. Furthermore, there is considerable question whether, in the short term at least, migration would really improve Japan's economic condition. Large-scale migration, if possible at all, would have to be to an undeveloped region such as the outlying portions of Indonesia or New Guinea. Experience has demonstrated that economic expansion in such undeveloped areas is not practical unless it is accompanied by heavy capital investment. Such investment would have to be at the expense of deferring current consumption in Japan at a time when her national income can ill afford the diversion of capital to such a long-range project.

The hard economic facts which point to the need for a wider application of birth control in Japan are unmistakably clear. The economic and social problems which would result from an unmanageable population problem would be so serious that action to lessen the magnitude of the problem should not be delayed. Much effort is being devoted by SCAP and the Japanese Government to problems of improving public health. The progressive and well-devised programs being carried out in that field will unquestionably result in a further lowering of the death rate. It would seem that the time has come for a parallel effort to spread the knowledge of the techniques of birth control so that human control over the birth rate can keep pace with the increasing effectiveness of the control of death. The means are at hand to accelerate greatly the dissemination of information. Public health clinics have been established recently in each of the forty-six prefectures of Japan, and it would appear that these clinics could be used to good advantage in spreading accurate information concerning methods of birth control. The Japanese Government is now engaged in establishing an enlarged agricultural extension program to provide farmers with the latest information concerning farm practices and other technical matters. In view of the seriousness of the problem of over-population in Japan's crowded farming communities, it would seem that utilization of the extension agents to promote a better understanding of birth control would make a major contribution to the solution of one of the most pressing problems of Japan's rural economy.

It is to be taken for granted that a wider practice of birth control eventually will follow in the wake of industrialization and urbanization in Japan as it has in the countries of Western Europe and in

the United States. The rapidity with which this trend will make itself felt is, however, a highly important variable which can be influenced significantly by action to encourage the practice of birth control. Unquestionably positive action in this field will be opposed vigorously by various groups in Japan and in the United States. General MacArthur has already received a protest from the Catholic Church in America regarding a statement by a SCAP spokesman which was construed as an indirect endorsement for the need for birth control. More recently the attitude has been expressed that SCAP should not concern itself with this issue since it is a purely Japanese problem. That would be a very convenient and unobjectionable position, were it not for the likelihood that for SCAP to ignore the problem is tantamount to taking a stand against birth control. As SCAP and the Japanese Government grapple with the problems of internal economic stability and the expansion of trade, it is also of great importance for them to face squarely the problem of population growth and to encourage measures which will facilitate dissemination of knowledge of birth control methods.

BASIC ECONOMIC AND WELFARE ASPECTS OF FARM TECHNOLOGICAL ADVANCE*

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TECHNOLOGICAL change is one of the more important dynamic forces affecting the structure and income of agriculture and its role in the national economy.¹ Numerous studies have dealt either directly or indirectly with this phenomenon. This paper is designed to add to the general literature on the subject, both as a refinement of points analyzed elsewhere and as an examination of certain neglected welfare and progress considerations.

Society has assumed a major role in furthering technological advance in agriculture; In contrast to other primary (and secondary and tertiary) industries, socialized services make up an important portion of the total quantity directed at uncovering innovations and speeding their adoption. There is an important economic basis for public financing of farm improvements (and equally those of other primary or subsistence industries.) Progress and welfare criteria suggest, however, that the responsibilities of society do not end with the unveiling of an heretofore unknown production function and its extension to farms. Positive steps have been taken to safeguard against monopoly control of innovations (a common case for the private patents of other industries). Yet if public sponsorship of farm technological advance is to have its roots in general economic progress, the responsibilities of society transcend this single measure to insure an efficient use of those resources over which innovations give a greater command.

Role of Farm Technological Advance in Economic Progress

As a primary industry agriculture possesses characteristics which qualify it for prior consideration in improvement of techniques. Wealthy societies are characterized not by how many but by how few resources are invested in primary industries (the basic materials from which consumer goods are ultimately fashioned). The fewer resources necessary here the more which are available for secondary

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(fashioning raw materials into consumption goods—especially in extending the degree of quality and luxury embodied) and tertiary industries (personal services and other activities which produce a non-material output). Progress is represented not by an economy with 95 percent of its resources tied up in primary production but rather by the opposite. Not only is the logic apparent but also empirical studies provide quantitative verification of the relationship.¹

/ In the same vein, agriculture as a source of subsistence goods qualifies for public investment in technology prior to luxury goods industries. / Only after the basic requirements of subsistence goods have been met is the vista of the consumer opened for full exploitation of the utilities to be derived from non-subsistence or luxury goods which in modern times indicate a wealthy society. Again, economic progress is marked by a paucity of resources invested in subsistence goods production. The fewer resources required here, the more which are available for production of various ranges of luxury or non-subsistence goods.²

/ The small scale of the firm in agriculture perhaps provides an additional basis for public sponsorship of farm technological advance.³ Individual farmers do not have funds for organizing research on a scale which will insure a high probability of discovery. However, society presumably has some goal such as higher farm income or general progress as a basis for its prior investments in technological advance in agriculture (as compared to other small-scale industries which are numerous). /

Nature of Advance

Technological improvement has two general properties. The first, development of a new production function such that a greater output of product is forthcoming from a given total input of resources,

¹ Cf. Colin Clark, *Conditions of Economic Progress*, MacMillan, London, 1940.

² Obviously, the difference between subsistence and luxury goods is one of degree. See K. E. Boulding (*Wealth and Income*, Canadian Journal of Economics and Political Science, Feb. 1939, and *Economic Analysis and Agricultural Policy*, Canadian Journal of Economics and Political Science, Aug. 1947) for a discussion of order among goods.

³ Had not research and education in agriculture been partly socialized, private research and extension work (salesmanship) would undoubtedly have developed to a greater extent. There are many obvious examples in hybrid seed corn, machinery and elsewhere. However, the spread of findings is undoubtedly greater than would have held without public investment (and under the patent system).

is illustrated in figure I.⁴ A corollary of this universal proposition is that technological improvement must momentarily increase the profits (or decrease the losses) of the firm.⁵ The firm would never adopt an innovation were not output increased from given resources or conversely, input decreased for a given output. (This is to say,

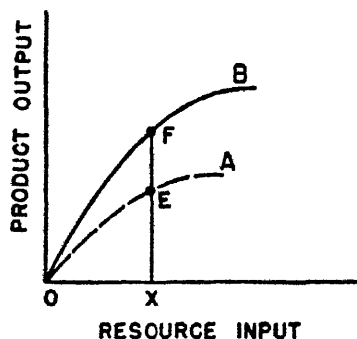


FIG. 1

the firm's cost curve must be lowered.) The only exception would be the case in which the innovation increased *ex ante* profit expectations through uncertainty or risk reduction. Even here the long-run and aggregate effect is likely of an output-increasing nature.⁶

⁴ Production function B represents technological advance as compared to A since with an input of resources of (say) OX, output is OF and OE respectively.

⁵ This does not mean that individual firms are always in an improved economic position after all or a large number have adopted the improvement. All can be worse off yet failure to adopt the technique by an individual would diminish his profits even more.

⁶ Development of production function A after B is already known could not be considered technological advance where the transformation coefficients (rate at which resources are transformed into product) are known with (or near) certainty. However, it would qualify as an improvement under the situation where uncertainty is reduced and hence the value of anticipated returns is increased. The transformation coefficient in agriculture is seldom known with certainty for a single production period even though the parameters of the distribution (mode, mean, range, variance) can sometimes be established mathematically over a number of years. Accordingly, production function A might be considered as an improvement over B when the variability of and uncertainty surrounding the former is less than for the latter. As an overly-simplified example, one point on the production function B might represent a resource combination (OX) which gives a mean yield of 20 bushels but with probabilities of .1, .2, .2, .1, .1, .1, 1 and .1 respectively among the individual yields of 0, 5, 10, 15, 25, 30, 40 and 60 respectively while a corresponding point on A represents a mean yield of 18 bushels but with probability values of .2, .6 and .2 for the individual yields of 16, 18 and 20 bushels. Although the *ex post* profits may be greater for B the *ex ante* returns may well be greater for A in the sense that profit expectations are discounted in terms of the degree of uncertainty. Adoption of A over B will be the case especially for the operator who is short on capital

Distinction between technological improvements which are output-increasing and factor-saving may apply to an individual industry or firm but it does not exist on an economy-wide basis. The basic nature of technological improvement is always the same in the economy as a whole. Aside from the uncertainty exception noted elsewhere, all technological improvements are output-increasing (from given resources) or conversely, (cost) input-decreasing (for a given output). An innovation is always output-increasing in the aggregate since although it may result in the same output from a smaller resource input by a given firm or industry, it frees resources for output expansion in other industries. In this sense all innovations stand to extend economic progress regardless of the industry to which they apply.⁷

Various characteristics can be used in classifying specific innovations. Some are outlined in following sections for use in later analyses. These are intra-industry classifications. They suggest possible outcomes for the agricultural industry, or segments of it such as geographic regions, or a sub-industry such as wheat.

Biological and Mechanical Innovations

! From a purely physical standpoint, farm innovations can be classified as biological or mechanical. By the term "biological" we will refer to those which have a physiological effect in increasing the total output (per acre, animal, unit of feed) from a given land base. The term "mechanical" refers to innovations as a machine which

or whose equity is so low that one or a few sustained losses may put him out of business. Technique A would seldom represent an improvement over B to a society which might insure a constant flow of commodity to consumers through a storage program (wherein the costs are sufficiently low to allow an economic carryover from bumper to failure years).

Even then, production function A might result in a greater output of the specific product than B. With a high degree of uncertainty as to outcome in any one production period under the latter the firm might rationally equate discounted costs and returns at a point which would be short of the optimal *ex poste* or historical marginal cost and return. With the "lesser degree of uncertainty" attached to the outcome under A, the firm would not apply as great a subjective discount to return expectations and would often end up with a greater input of resources and output of product. Although the distinction is somewhat different, the innovation would still be output-increasing for the individual firm and product.

⁷ Progress can be defined as an increase in ends relative to means. (Cf. K. E. Boulding, *Economic Analysis*, Revised Edition p. 647. Harper and Brothers, New York, 1948.) This paper is concerned with a particular aspect of progress—minimizing the quantity of resources necessary for the "required" output of subsistence goods or minimizing the input of resources for the flow of primary materials from the given stock of basic resources.

substitutes capital for labor but do not change the physiological outcome of the plants or animals to which it may apply. Many mechanical innovations also have a physiological effect in increasing timeliness of operations, soil structure or otherwise directly affect the plants or animals. For the sake of simplicity, techniques which have both effects are termed "biological-mechanical."

The immediate effect of biological innovations (as classified here) is one of increasing both total output and total costs (per acre or per farm or per aggregate of farms which retain production). Hybrid corn, fertilizer, improved rations and similar techniques result in a greater total output. However, they also increase total costs (even though costs per unit ordinarily decrease) since not only the original costs of rearing, cultivating and harvesting are incurred but also the added costs of seed, supplies and of harvesting and handling the greater output are included.⁸ The first effect of mechanical innovations is one alone of reducing total costs. A biological-mechanical innovation may increase or decrease total costs depending upon whether the added expense associated with the harvesting and handling of the greater output is less than the reduction due to the engineering recombination of resources. /

Revenue and Cost

Public sponsorship of technical advance was perhaps originally drafted as a specific policy to increase farm income. Many still view public research and extension education in this light. The manner in which net returns are affected by specific technological improvements depends, however, upon the (price) elasticity of demand for the specific product and the effect of the innovation on 1, the total output and 2, the total costs of production. Models of possible outcomes are illustrated by figures 2 and 3. The curves labeled R indicate total revenues from sale of various outputs. The inclining portion indicates a price elasticity of demand greater

⁸ Those biological innovations which relate to livestock such as improved breeding, sanitation and nutrition may at first appear to lower costs alone since they allow a greater output with less feed and other resources. This may be true in the short-run. However, in the long-run the saving in feed allows and leads to a greater number of animals and output of livestock products. As the slack is taken up in feed and other resources saved, added resources in housing and labor are also necessary to handle the greater amount of animals and products. Otherwise, the effect is of the mechanical nature outlined here. Too, it should be remembered that the analysis here is in terms of the industry. Although some farms may produce the same livestock with less feed, as feed "saved" is used on increasing output on other farms, total industry costs may increase as total costs decline on some farms.

than unity (a greater output sells at a lower price per unit but brings a greater total revenue). The declining portion represents an elasticity of less than one (a larger output sells at a lower price and brings a smaller total revenue).

I. *Demand elastic; total output and total cost-increasing innovation.* An innovation which increases both total output and total costs to the industry is illustrated in figure 2. Distinction between innovations in respect to their effects on the cost in a single industry must

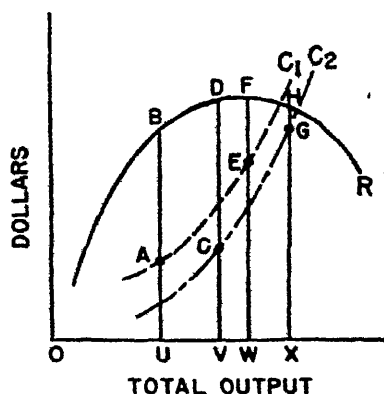


FIG. 2

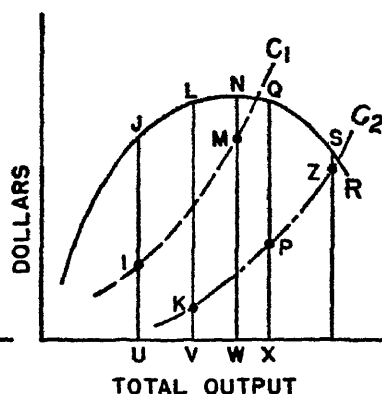


FIG. 3

be in terms of total costs. All innovations lower the per unit costs of production. Otherwise they would not be adopted (with the uncertainty exception already noted).

Net returns must increase if the increase in total revenue is greater than the increase in the total costs. This is illustrated by curves C_1 (figure 2) which represent the schedule of total costs for the old and C_2 for the new technique. Total output, total cost and total revenue previous to the innovation (C_1) are OU , UA and UB respectively. After the innovation (C_2) output increases to OV , costs to VC and revenue to VD . Net returns (AB) for the old technique are less than those (CD) for the new technique (since net = total revenue minus total cost).⁹

⁹ Under competitive conditions costs will equal revenue for the industry. However, this is true only for the sum of explicit and implicit costs. The diagrams indicate only explicit or out-of-pocket costs. The net incomes AB and CD represent returns to unpaid operator and family labor, and capital and any "pure" profits. For a single firm maximum net profit is represented by that point which defines the greatest difference between the total revenue and cost curves. However, this need not be the point of equilibrium for cost and revenue curves representative of a competitive industry.

Presence of an elastic demand does not, however, guarantee an increase in net income. Net income will be decreased by an innovation which increases gross revenue but by a smaller absolute amount than the increase in total costs. Suppose that the pre-innovation output, costs and revenue are OU, UA and UB respectively (figure 2). A biological-type innovation which increases the corresponding items to OW, WE and WF will decrease net income from AB to EF.

II. *Demand inelastic; total output and total cost-increasing innovation.* Under this combination, net revenue of the industry must always decrease. Diminution of gross revenue always accompanies an increase in output where demand is inelastic. The greater costs reduce net return even further. This is illustrated in figure 2 where EF, the net income before the improved technique (C_1) is greater than GH, the net return after the increase in total output and cost (C_2). Only biological-type innovations fall within the situations outlined under I and II.

III. *Demand elastic; total output constant and total cost-decreasing innovation.* Net revenue must always increase since gross revenue is unchanged while total costs decrease.

IV. *Demand inelastic; total output constant and total cost-decreasing.* Net revenue must always increase for the exact reasons outlined under III. Innovations of the pure mechanical type fall under the number III and IV categories.

V. *Demand elastic; total output-increasing and total cost-decreasing.* This combination must always result in a greater net income to the industry since total revenue increases while total costs decrease. This situation is illustrated in figure 3 where the net return (KL) under the new technique (C_2) is greater than the net return (IJ) under the old technique (C_1).

VI. *Demand inelastic; total output-increasing and total cost-decreasing innovation.* Two possible outcomes are possible here. Total revenue must be less. If the decrease in total revenue is greater than the decrease in total cost, net revenue will also decrease as is illustrated by figure 3. The net return (MN) under an old technique (C_1) is greater than that (ZS) under a new technique (C_2). However, if the reduction in total revenue is less than the decrement in total costs net revenue must increase. This possibility is also illustrated by figure 3. Net income will increase from MN under an old technique (C_1) to PQ under a new technique (C_2) since the reduction in total revenue (from WN to XQ) is less than

the decrease in costs (from WM to XP). Biological-mechanical innovations result in the outcomes outlined under V and VI.

All innovations extend progress. However, specific innovations may or may not increase the income of the agricultural industry. The final outcome depends on the combination of forces outlined. In final equilibrium all individual firms may have smaller net incomes than in a pre-innovation period, but failure to adopt the

TABLE 1. PRODUCTION COSTS AND INDEX OF FARM OUTPUT FOR SPECIFIED PERIODS

	Index of farm output ¹⁰ 1935-39=100	Production costs (1910-14 dollars) ¹¹	
		Million dollars	Index 1935-39=100
1910-14	79.4	2,860	80 1
1915-19	85 4	2,272	77 1
1920-24	88 4	2,880	96.0
1925-29	95 8	3,208	108 8
1930-34	94.4	2,957	100.3
1935-39	100 0	2,949	100.0
1940-44	121.4	3,762	127 6
1945-46	131.0	4,545	154.1

technique would result in an even greater diminution in returns. Or, individual firms remaining in a segment of the industry (as for example, cotton producers) may have as great or a greater income but the industry may have a smaller net return because of fewer firms. Finally, it should be recognized that even though the long-run and aggregate effect of an innovation may be to reduce net income to all farmers, the few farmers who first adopt the technique will have greater income (until the number adopting be-

¹⁰ Figure for 1919-46 from *Agricultural Statistics* 1946 and 1947. Figures for 1910-18 estimated by the writer.

¹¹ Based on data from *Agricultural Statistics* 1946 and 1947, and BAE Processed Report, *Net Farm Income and Parity Report*, 1943. Includes all production expenses of farm operators and landlords except taxes and mortgage interest payments. Does not include charge against land, capital or operator or family labor. Also feed and livestock have not been included since these represent purchases within agriculture. This system perhaps excludes 5-10 percent of total production costs to farm operators and landlords. Farm wage payments are included. Absolute quantities have been adjusted to a 1910-14 wholesale price base (in attempt to correct for value of the dollar). Unadjusted figures indicate, of course, an even greater increase in costs. Unadjusted costs were greater during the 1930's than for the period prior to World War I. Even in the absence of technical change, costs would be increased under favorable cost/price situations. However, the 1930-39 period was certainly less favorable to the use of additional resources in the absence of new techniques than the period 1910-24.

comes great enough to lower prices sufficiently to decrease incomes). Or, as is brought out at a later point, some farmers may end up with a larger income although net returns to the industry decrease.

Innovations of the various types have taken place side by side. However, available evidence indicates that aggregate farm technological advance has been of an output-increasing and likely of a total cost-increasing nature (the number II model outlined above). At the minimum, costs have not decreased. Demand analysis

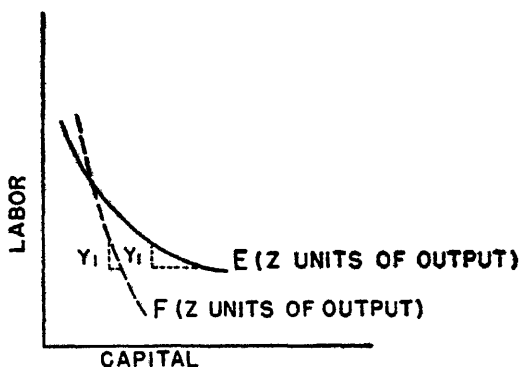


FIG. 4

suggests an aggregate elasticity of demand for farm products far less than 1.0 (under a given demand situation, the greater the total production the smaller the total revenue).¹² Although other economic forces bring about increases in demand and income, aggregate technological advance per se, if it falls under model II, results in a revenue lower than would otherwise hold under given demand situation.

Productivity of Specific Resources

Changes in value productivity of specific resources such as land, labor and capital may differ widely irrespective of the income-

¹² Cochrane has arrived at an aggregate price elasticity of $-.41$ for food products ("Farm Price Gyration—An Aggregate Hypothesis," *Journal of Farm Economics*, May, 1947). G. S. Shepherd of Iowa State College (unpublished data) has arrived at a similar figure. For any elasticity of less than -1.0 , an increase in output must be accompanied by a decrease in revenue since an increase of (say) 1.0 percent in output will result in a price decline by more than 1.0 percent. Johnson ("Economic Models and Agricultural Policy," *Journal of Farm Economics*, February 1948) and Haavelmo ("Quantitative Research in Agricultural Economics," *Journal of Farm Economics*, November 1947) also provide data indicating an elasticity of around $-.5$.

effect of innovations (whether net income is increased or decreased). An important consideration here is the effect of new techniques upon the elasticity of substitution of resources (the marginal rates of physical substitution). The second universal property of innovations in agriculture is this: The marginal physical rates of substitution (the elasticity of substitution) are always altered in favor of one factor by specific innovations (the entire production surface is changed). This property is illustrated geometrically by the iso-product (equal product) contour of figure 4. For a given output of product (say 100 bushels of wheat or 100 pounds of pork) the iso-product line representative of a new technique (F) will always have a greater slope in the direction of one factor than under an old technique (E). The position of new contour must be partially or entirely lower (to the left) than the old. (One which falls entirely to the right would indicate a greater input of all factors for a given output and thus would not coincide with our first general property of innovation.) Thus a smaller quantity of one factor such as "capital" will be necessary to replace a given quantity of another factor such as "labor" after as compared to before the innovation (in terms of a given product output).¹³ This characteristic is obvious for engineering innovations in which machines substitute for labor. It is not so apparent for biological improvements such as hybrid corn. Yet the basic relationship is the same.¹⁴

The marginal physical productivities may be changed in "favor"

¹³ In the example illustrated, the elasticity of substitution has been increased in favor of "capital" as is indicated by the greater slope of contour E. Under the old technique, 4X of "capital" was necessary to substitute for the Y_1 unit of "labor" while only X is required under the new technique. The marginal physical and value productivity of "capital" has been increased relative to that of "labor."

¹⁴ Prior to the advent of hybrid corn, for example, a given quantity (or increment in output) of corn might have been forthcoming by cultivating fewer acres with more intensive applications of labor and capital on the remaining area (substitution of labor and capital for land). The hybrid seed itself and the greater input of "non-land" resources used in harvesting it represent added resources for a given acreage but a smaller total quantity of labor and capital applied in intensive cultivation on the remainder would be necessary to substitute for additional land which might be employed in producing a given output. The number of innovations which might possibly fall outside of this classification are unimportant in number and effect. Although specific techniques may appear to so qualify, closer scrutiny places them within the proposition. For example, it may appear that this would be true for a crop which is planted at a more favorable time period with the consequence that a greater product is forthcoming from the same input of labor, capital and land. While the increased output will be from the same land resources, additional capital will be required however, for harvesting and processing even within agriculture. Accordingly, the previous output can now be produced from less land and more labor and capital. The innovation again alters the marginal physical rates of substitution.

of land, labor or capital depending upon the specific innovation. For purposes of later references we will define "labor-substituting" innovations as those for which the elasticity of (physical) substitution has been changed in favor of labor. Similarly, we may have "capital-substituting" and "land-substituting" innovations.

For pure mechanical-type innovations (change in factor combination without an increase in output) value productivities will be changed in the same direction as (physical) substitution elasticities. Thus a capital-substituting technique would lower the value productivity of labor and raise that of capital. However, even though the mechanical-type innovation has no biological effect it may have an economic effect in increasing output. If costs are lowered sufficiently, equation of marginal costs and marginal returns in the post-innovation period may still call for an increase in output. Then whether or not the value productivity of (say) labor is decreased or increased will also depend on the elasticity of demand for the product (and whether net return is increased or decreased). If output is expanded, "labor" and "capital" may serve either as substitutes or cooperants.¹⁵ The value productivity (in absolute terms) of "labor" for example, will increase only if the two factors serve as cooperants. They will act as cooperants (the value productivity of "labor" will be increased) only if the elasticity of demand for the final product is sufficiently greater than the elasticity of substitution of "capital" for "labor" (under the innovation). The value productivity of labor would always be lower under an inelastic demand.

A similar situation holds for biological and biological-mechanical innovations. Under those situations where net income is increased the various factors may again serve as cooperants (if the elasticity of demand for the final product is sufficiently greater than the elasticity of factor substitution) with a corresponding increase in value productivities. Even though net returns are increased, the value productivity of (say) "labor" may be decreased, however, if the (new) elasticity of substitution of "capital" for "labor" is sufficiently greater than the demand elasticity of the final product. A decreased net return must obviously result in a lower value productivity for part or all of the resources, depending upon the extent to which

¹⁵ They will be (a) substitutes if the greater output is forthcoming with more capital and less labor and (b) cooperants if the increase in output is accompanied by a use of both more capital and labor.

the innovation alters the elasticities of factor substitution. For later reference, we will define labor-saving, labor-neutral and labor-using innovations, for example, as those which decrease, leave unchanged or increase respectively the value productivity of (returns to) labor.¹⁶ The same definitions will apply to capital and land. An innovation might thus be capital-using and both labor and land-saving.

Finally, we will define an innovation as land-embodiment and capital and labor-rejecting (and vice versa) where the combined effect of the innovation on the elasticities of substitution and value productivities is such as to result in a given output of product with a greater proportion of land and a smaller proportion of capital and labor (the absolute quantity of land embodied in the product may be either greater or smaller but the proportion must always be greater).¹⁷ An innovation may be land-embodiment even though it is land-saving in terms of lowering returns or value productivity of land to the extent that the same technique is "saving" for both capital and labor and drives them to other industries (because of the lowered returns) and the final burden of lower returns is expressed in lower rents.

Aggregate technological advance over the last three decades has evidently been in a land-embodiment direction. A greater product has been forthcoming with some increase in land and a decline in labor input. Also up to World War II a greater product was possible

¹⁶ Lange, Oscar, "A Note on Innovations," *Review of Economic Studies*, Vol. XXV, 1948. We are interested here only to the extent that value productivities are increased or decreased in an absolute sense. This is in contrast to the use of these terms by Hicks (*Theory of Wages*, London, 1932, pp. 121-122) and Pigou (*The Economics of Welfare*, London, 1938, pp. 674-675) to indicate relative factor shares.

¹⁷ An example of a land-embodiment innovation has been the development in wheat production especially. As the location of wheat production moved from New England to the Great Plains States a given quantity of output has come to be produced with more acres of land but with less labor generally and often with less total capital. A similar development has taken place the world over in several decades as new areas have shifted to wheat. Mechanization of cotton production may have a similar land-using and capital and labor-saving effect once it comes into full play. It is entirely possible that cotton production will spread over more acres (especially in replacing much of cropland now devoted to mule feed) while using a smaller total quantity of labor and capital. Were chemical sprays to substitute completely for cultivators in corn production, it is possible that this single innovation might be of a land-embodiment (labor and capital-rejecting and labor and capital-saving) nature. The major change in capital relates to rate of transformation into product. A smaller non-real estate capital indicates a smaller investment in capital which is transformed only over many production seasons (with depreciation as the portion transformed or the expense within one production period). A greater production expense in the face of a declining use of labor then indicate a greater input of capital which is transformed in one or a few production periods such as fertilizer, tractor fuel and similar items which are termed operating expenses in accounting.

with a relatively constant (non-liquid and non-real estate) capital input. The change in capital has been more in form than in total quantity. The change in form of capital created by innovations perhaps promises to increase the substitutability over time of land for both capital and labor in producing equal outputs of food and fiber.

TABLE 2. TOTAL EMPLOYMENT OF LABOR, LAND AND WORKING CAPITAL FOR SPECIFIED YEARS

	Average farm employment ¹⁸ (thousands)	Acres of land in farms ¹⁹ (millions)	Total non-real estate capital (millions of dollars)	
			Unadjusted ²⁰	Adjusted ²¹
1910	12,146	879	7,160	7,042
1915	11,981	—	8,872	7,227
1920	11,362	956	14,011	7,459
1925	11,448	924	8,841	6,382
1930	11,173	987	10,498	7,440
1935	11,131	1,055	5,879	4,826
1940	10,535	1,061	8,468	6,277
1945	9,844	1,142	17,094	9,315

Income Transfers

New techniques may transfer income and wealth between individuals regardless of whether total net farm income is increased or decreased. The transfer may be of an intra-industry nature in the sense that it increases the income of some people in agriculture at the expense of other people within the industry. Income will be transferred when the techniques for one commodity or geographic region are improved beyond that which applies for a competing commodity or region.²² This situation can hold regardless of the elasticity of demand as is illustrated by Table 3. In the period 1937-46, for example, corn yields were greater by 45.8 percent in Grundy County but by only 6.8 percent in Wayne County, Iowa as compared to the pre-hybrid era, 1920-29. A decline in price by

¹⁸ BAE, "Farm Wage Rates and Related Data" (Washington: USDA, 1948).

¹⁹ *Agricultural Statistics*, 1947.

²⁰ BAE "Net Farm Income and Parity Report," 1943 and *The Farm Income Situation* June-July, 1947.

²¹ Based on "3" and individual capital items from *Agricultural Statistics* 1942 and 1947 adjusted to a 1910-14 price level or value of dollar base to suggest the physical volume.

²² A somewhat similar type of transfer may also take place in this sense: The first few farmers who adopt an output-increasing technique will realize higher incomes even if the demand is inelastic since, in a competitive market, small changes in supply have small effect on price. However, as the majority adopt the innovation, the total outcome is smaller incomes (even though net income would be even less for the "following" were they not to adopt the new technique).

25 percent (because of the innovation and greater total output or for any other reason) would result in a greater total revenue per given acreage in the former and a smaller total revenue in the latter county. (The varying responses indicated in table 3 are not necessarily due to hybrids alone but the result is the same as long as innovations do not apply equally to areas or are not adopted at equal rates).

TABLE 3. YIELD PER ACRE OF CORN IN TWO PERIODS
FOR SPECIFIED GEOGRAPHIC REGIONS²⁵

Region	1920-29 Average	1937-46 Average	Percent Change
Wayne County, Iowa	34.0	36.3	+ 6.8
Switzerland County, Indiana	31.6	34.2	+ 8.2
Tipton County, Indiana	42.8	56.3	+31.5
Grundy County, Iowa	43.0	63.1	+45.8
State of Georgia	10.8	11.4	+10.7
State of Kansas	21.8	21.6	- .9
State of Pennsylvania	42.1	42.3	+ .5
State of Missouri	29.0	30.6	+ 5.5
State of Iowa	40.5	52.1	+29.0
State of Illinois	35.9	49.1	+36.8

A second possible transfer-effect is of an inter-economic unit nature. One group of individuals such as producers of farm products may lose in terms of dollar and real income as the consuming economy gains in real income. This type of transfer will hold where total output is increased and (price) elasticity of demand is less than unity (and if total costs remain constant or increase).

Innovations which have an income transfer-effect must also have an associated effect on the wealth of individuals. Asset values must change as the increment or decrement in income is capitalized into land and specialized capital resources. Once the capitalized value of assets has decreased the resource owner cannot transfer his pre-innovation wealth to other industries. However, the individual whose resource inventory has increased in value can transfer the greater post-innovation wealth if he chooses to do so.

Alternative Goals

✓ The direction given farm technological advance might well differ depending upon the specific ends to be attained. Among others alternative goals toward which publicly sponsored technological

²⁵ Source *Agricultural Statistics* and Crop Reporting Statistics for the specified states.

improvement might be directed include 1, increasing the total net income of the agricultural industry 2, increasing the total utility or welfare of individuals now in the agricultural industry and 3, maximizing aggregate economic progress.²⁴ These alternative goals are not identical and without conflict. Attainment of a greater net farm income does not guarantee a greater total welfare of people now in agriculture. Total utility or welfare of a community of individuals is a function not only of the magnitude of the income but also of the distribution of this income. To the extent that increases in income are accompanied by a transfer of income, total utility will increase or decrease depending on whether the gain in utility to individuals with augmented income is greater or smaller than the loss in utility to those whose income is lessened. Similarly, improvements which lessen the gap in incomes in the face of a smaller total income may or may not increase total farm welfare depending on the nature of the inter-personal transfer of income. Attainment of economic progress (in the sense of minimizing resource inputs for the "necessary" output of subsistence food products) would generally exclude attainment of the other two objectives. Under the pricing system, a continuous depressing of net income and welfare to people in agriculture would be necessary to drive innovation-freed resources to other industries.

The outcome of resources invested in research on a specific commodity or innovation cannot be predicted with certainty. However, the probability of success along the line of any specific innovation (say, improvement in wheat as compared to soybeans) is dependent to a fairly large extent on the quantity of research resources marshalled in the specific area of investigation. Given this degree of control over discovery and adoption (through allocation of funds between and within agricultural experiment stations and extension services) society has the power to exert important influence over farm technological advance. What type of technical innovations might be extended were any single one of the above objectives to serve as the criterion in guiding technological improvement in agriculture?

²⁴ Other goals might include (a) the greatest net income per farm and (b) increasing the income of farmers who first adopt new techniques. Obviously, these are partially compatible and partially conflicting with each other and with other goals outlined. Total economic welfare might represent still another goal and while partly allied with the total farm welfare or economic progress goals as defined here, it is not identical. Consideration of total economic welfare as it relates to the economic progress goal is made at a later point.

1. *Increasing the total net income of the agricultural industry.* Were this the goal of farm technological advance, price elasticity would serve as an important gauge in directing development and adoption of innovations. Total output and total cost-increasing (biological) innovations would be withheld where demands are inelastic and extended only for commodities with elastic demands (and then only as long as the increase in total revenue is greater than the increase in total cost). Output-constant and total cost-decreasing (mechanical) innovations would be extended for all commodities irrespective of demand elasticities. Total output-increasing and total cost-decreasing techniques (biological-mechanical) would be developed for all commodities with elastic demands but for those with inelastic demands only if the decrease in costs were greater than the decrease in revenue. Finally, if the goal of public investment in techniques were alone one of increasing or maximizing agricultural income, a large portion of effort would be focused not on discovering new production functions in agriculture but in increasing the (price) elasticity of demands for farm products. This would especially mean development of new industrial uses for farm products. Emphasis would be given to increasing the substitutability of basic farm materials for the materials of other industries. To the extent that this were accomplished, net income in the agricultural industry would be increased at the expense of income in other primary industries.²⁵

2. *Maximizing or increasing the total welfare of individuals now in the agricultural industry.* Were increasing net farm income the single objective of public-financed technological improvement, no regard need be given the nature of the total utility function or the distribution of income. However, distribution of income is as important as magnitude of the income were maximizing the total welfare of people in agriculture to be taken as the goal. If all resulted in an increase in the magnitude of net farm income and

²⁵ A somewhat different avenue of attack would revolve around income elasticity. Here research funds would be invested not in farm technology or the farming industry per se but in research relating to segments of the economy entirely apart from agriculture. Special emphasis would be given to means of increasing the incomes of all low income persons in the economy (either by additions to a given national income or by transfer of a given national income between high and low income groups perhaps via the machinery of progressive taxation on the one hand and consumer subsidies in the form of food and clothing stamp plans on the other). It is known that income elasticity for farm products, especially food, is greatest for low income families. The market differences in prices and income between the 1930's and 1940's emphasize the greater efficiency of economic as compared to technological forces in augmenting net farm income.

none resulted in a transfer, the innovations outlined under 1 would also be applicable under 2. However, on the basis of the total farm welfare criterion, these improvements would not qualify were the increase in total income associated with an income redistribution such that the increment in utility to the "receiving" group is less than the decrement in utility to the "losing" group.

Progress towards the total farm welfare goal might be attained (at the expense of the total net farm income goal) by output and total cost-increasing innovations even where demand elasticity is less than unity provided these conditions hold: 1, the percentage increase in output is greater on low-income farms than (a.) the percentage decrease in price and (b.) the percentage increase in output on high-income farms; 2, the increment in utility associated with greater revenue on low-income farms is greater than the decrement in utility associated with the decrease in revenue on the high-income farms.²⁸ Special emphasis would be given to extending output-increasing techniques in low-income areas relative to other geographic areas (the innovation would be equally applicable to high-income farms in the area of course). For example, a greater quantity of society's funds might be spent on output-increasing techniques in southern Iowa than in central Illinois or in Alabama than in Indiana. Or if the producers of one commodity (A) were predominantly poor while the producers of a closely competing commodity (B) were predominantly wealthy, resources might be concentrated on innovations which improved the former relative to the latter product. Total farm welfare might thus be increased to the extent that the increment in utility to A producers were greater than the decrement in utility to B producers. The simple transfer would, however, represent a crude system of transferring income where some producers of A have high incomes while some producers of B have low incomes. Other techniques which would especially qualify under the "total farm welfare" criteria might be "engineering" or cost-reducing techniques which are adapted to farms with small quantities of resources.

3. *Maximum economic progress.* Given this goal of farm technological advance, a somewhat different set of innovations would be emphasized. Continuous progress toward this end would require both lower total farm returns and total welfare of people on farms

²⁸ Implicit in this statement is also the condition that the increase in revenue be greater than the increase in costs on low-income farms and that the reverse hold true on high-income farms.

in order that the pricing system might effect a transfer of resources to non-subsistence industries. In order that resources be driven out of agriculture, any increments in income from some innovations would have to be more than offset by decrements in income by other innovations. Output-increasing techniques would never be extended (except one category of biological-mechanical innovations) for commodities with inelastic demands under the total farm returns goal. Yet these are the very commodities which would be given heavy emphasis for the progress goal. The greater the price elasticity of demand the higher the commodity ordinarily (but not always) stands in the scale of luxuries. For the progress goal, luxury farm commodities with an elastic demand would have no greater priority on public-financed technological improvements than non-farm luxuries.

Maximum economic progress would be characterized by land-substituting (including reclamation of land) and land-embodiment and never by capital-using and labor-using innovations. Aside from the small portion of total land area devoted to non-agricultural uses, land is not transferable to other industries.

Instability

Technological improvement which is founded on economic progress must result in continuous instability of subsistence or primary product industries. Resources must be in a constant flow out of these industries. Measured by the same criterion, the value productivity or returns on resources must be constantly lower than in other industries (to which surplus resources are being transferred). Progress becomes characterized by low returns on resources in agriculture (and other subsistence goods and primary products industries).²⁷ Higher resource returns in subsistence than in luxury goods industries represents retroversion rather than progress.²⁸

²⁷ Dr. T. W. Schultz seems to express concern that technological advance has done nothing to increase the value productivity of farm resources (How Efficient is American Agriculture, *Journal of Farm Economics*, August 1947). However, if the goal of improved techniques in agriculture is taken as general progress then the low value productivity of resources marks positive accomplishment of farm innovations.

²⁸ Some might raise the point that technological progress must go hand-in-hand with increasing resource returns were population to increase, nutritional levels and demand to be raised etc. However, the criteria of economic progress still apply. Suppose that the original demand (need) is for y output of subsistence goods and that these can be produced in a pre-innovation period with x resources. In the absence of changes in demand (need) for subsistence goods, progress would be represented by development of techniques which would allow y output with less than x resources. Now suppose that population or nutritional standards double such that the demand (need) is $2y$. However, it is still desirable, in terms of progress to produce

A progress goal of publicly financed farm technological advance must necessarily be one of increasing the physical product while decreasing the value of product per unit of resources in agriculture.

Welfare Criteria and Compensation

Economic reorganizations can be segregated into two categories depending on their effect upon the welfare of individuals. Specific reorganizations may either 1, increase the welfare of one person or group without diminishing the welfare of others or 2, increase the welfare of some individuals at the expense of others. Total economic welfare is always increased under the first. It increases under the second only if the increment in utility or satisfactions to the recipient group is greater than the decrement in utility to the sacrificing group. Since inter-personal utility comparisons are impossible, objective measurement of outcome under a transfer (the second category) is impossible. However, the impossibility of interpersonal utility comparisons does not exclude society's ability to fashion policies which it deems consistent with a greater total welfare.

Although inter-personal comparisons of utility are impossible, society has based policies on obvious differences in individual welfare. The poor are not taxed at a heavier rate than the rich, for example, in order that elementary education be furnished the latter. There are many other areas in which the order and direction of needed reorganization are clear. However, the nature of transfers in income which grow out of farm technological advance are not of an orderly fashion: consumers who realize gains in the form of more food for less money are not generally poor and farmers whose income may diminish are not universally wealthy. Similarly, producers of one commodity or region who gain from a specific improvement are not universally of the lower-income strata while others within agriculture who sacrifice as producers in a competing region or of a competing commodity are not universally of the high-income strata.

Perhaps at the outset social investment in farm technological advance was thought to fall under the category of *leaving some individuals better off without leaving any others worse off*. Present knowledge of demand elasticities questions any such unwitting assumption for agriculture as a whole and for a very great number of single products. The principles developed in modern welfare

the 2y output not with 4x or even by x input of resources but by $\frac{1}{2}x$ or any smaller quantity. The level of technique would need to be stepped up even further to allow expansion of non-subsistence industries.

economics provide the basis for guaranteeing that total welfare can be increased even though the reorganization is in the form of transfers.²⁹ Lack of inter-personal utility comparisons excludes possibility of empirical evidence to indicate the utility of those gaining from a transfer is increased by more than the satisfactions of those sacrificing is decreased when there is no order in the reorganization. However, this difficulty can be removed by compensation to redress impaired income positions and guarantee that no person is "worse off."

A bulk of the agricultural policy legislation of the past two decades can be interpreted literally as society's belief that 1, farm income is less than would have been true had the capacity of agricultural resources not been increased so greatly by technological improvements and 2, compensation is in order to redress general impairment of the farm economic position which has grown out of increased output and technological advance. The provision for production control is prime evidence of the first (a smaller output to attain a greater revenue) while the cordon of subsidies designed to restore farm earnings at historical levels is material evidence of the second. Society has simply recognized that the greater flow of production growing out of its designed policy of improved farm technology has increased total welfare at the expense of returns to the farm population.

Although the action conforms with principles of modern welfare economics, a conflict must be recognized. If farmers are made as well off relatively in post-innovation as pre-innovation periods, forces will not be generated to drive the surplus resources to other industries. The apparent dilemma is not insoluble. Means exist both for redressing impaired farm returns and speeding the flow of resources to non-subsistence industries. Society has an ipso facto policy designed to bring about surplus resources in the farming industry. It should have an equally positive policy directed at speeding the movement of resources out of agriculture.

There are few precedents whereby society has provided full compensation to guarantee that all individuals are "as well off after as before" economic reorganizations. (Too, there is question as to whether the status of the past provides better criteria than the "possibilities of the future" as a benchmark from which reorgani-

²⁹ Cf. J. R. Hicks, "The Foundations of Welfare Economics," *Economic Journal*, Dec. 1939 and T. de Scitovsky, "A Note on Welfare Propositions in Economics," *Review of Economic Studies*, Nov. 1941.

zations might be fashioned.) Accordingly, it is questionable whether society should attempt, or whether a full scale, innovation-inspired program of compensation is feasible. Yet a minimum program of compensation is certainly in order. Society should provide the mechanism whereby those resources whose returns have been lowered can be moved into alternative opportunities where returns on resources are higher.

Barriers to Mobility

A positive policy is needed to catalyze the movement of surplus resources from agriculture. In fact here lies the crux of any economic policy which has the long-run dual objectives of increasing the income *per individual in agriculture* and of maximizing general economic progress.

But first the forces which serve as obstacles to mobility need be examined. These are numerous and most have economic roots.

1. *Lack of knowledge.* A large portion of individuals are so preoccupied in their micro-environment that they do not comprehend the macro or aggregate economic adjustments which are shaping their destiny. In spite of the "enlightening effect" of low incomes, many hold on with hopeful expectations that "things will improve" or "a solution will be forthcoming." Distinction is not made between short-run phenomena such as the business recession and long-run readjustments such as changes in techniques. Furthermore, the market is imperfect in the sense that knowledge of comparative returns is meager, first, for alternative products and regions within agriculture and second (and even more important), for use of resources in non-agricultural as compared to agricultural pursuits. Too few know "where to go" and the "level of income to be expected" were they to leave agriculture.

2. *Cost of transfer.* Movement between industries and geographic regions involves perhaps as many as three types of costs: (a) direct expense of migration (b) direct loss in income during the period of transfer and (c) loss of investment in resources impaired in value and made obsolete by the reorganization.³⁰

3. *Risk and uncertainty of returns.* The uncertainty of returns on resources transferred from agriculture is mitigated by the

³⁰ A machine, for example, may be made obsolete to the extent that its market value is depreciated. Yet the farm owner may recoup as much of the original cost through use as was reflected in the original investment. The loss here comes about only in the market value of the asset. In highly depressed farming areas, this cost of transfer itself acts as an important obstacle to mobility.

business cycle. The feeling of greater security on the farm is ingrained in farm persons to an extent that many prefer a smaller return in agriculture to a higher mean (non-farm) income over time which may vary from zero (unemployment) to a level several times greater than farm expectations. The possibility that the period of low income or unemployment in industry may follow immediately after the shift augments the degree of uncertainty and returns discounting. Experience with moratorium laws perhaps provides the basis for farmer belief that the recession may be bridged in agriculture through these time-consuming processes. The opportunity for a greater inter-temporal transfer of income in agriculture also exists as the operator increases present at the expense of future income through soil exploitation and postponement of depreciation reserves.

4. *Inflexibility of human capacities.* Flexibility in human capacities wanes with the individual's life. It is greatest before initiation of technical schooling or apprentice training since the individual can, within the limits of his natural abilities and economic means, turn in any direction. However, once his career has been launched and his family responsibilities grow he is increasingly unable to take time out to acquire skills necessary for alternative economic opportunities. Even though his innate capacities, were they fully developed, provide the basis for greater returns in other lines, inability to capitalize on his abilities through new training may leave him in a position where returns are greatest in the old occupation even though these have been lowered. Another facet of this same problem is the lack of opportunity for investment in the human resource other than by the public or by the individual himself.

Innovation-Inspired Mobility Policy

Maintenance of a high and stable level of national income is, of course, a necessary condition for resource mobility. Only then can uncertainties which attend movement of human resources be minimized. Mobility policy should also meet two general tests: (a) It must not destroy freedom and choice of the individual in respect to type and place of employment. (b) It must increase the total economic product. Given these conditions and farm technological advance as an economic progress goal, the following are logical policy steps:²¹

²¹ For other proposals along these lines see T. W. Schultz (Agriculture in An Unstable Economy, McGraw-Hill Book Company, Inc. 1946) and D. Gale Johnson

1. *Economic outlook for specific technical improvements.* Estimates of the economic impact (interproducts, interregional and inter-industry productivity and shifts of resources; effect on incomes) should be provided for each major innovation. These should be aggregate and forward analyses rather than indication alone of the immediate profitability to individual farmers.

2. *Nation-wide employment service.* A nation-wide employment service should supply information on the location, type and returns of employment. In this vein it would both aid in reducing the uncertainty which surrounds mobility and in channeling resources into opportunities where value productivities are greatest. The objective here, as for other policy elements outlined, is both one of increasing the individual welfare (compensation for impaired income) and the social product.

3. *Provisions for increasing the flexibility of human capacities.* Industrial employment training should be carried to individuals (already established in farming) in regions where the returns on resources have been lowered. A program of this nature would increase the value productivity of individuals above that which might be realized were they to migrate without acquiring new skills and training. Where the adjustment required is of great magnitude, some form of "training-compensation" might be in order were family finances not to be cut too severely in the interim of the training period. Another element of this program would be greater emphasis and broader education on industrial employment and non-farm opportunities in the secondary schools of agricultural areas. With technological advance as an economic progress goal (minimizing the resources in agriculture as a primary or subsistence good industry) this facet of education is equally as important as vocational agricultural training designed both to return young people to farming and extend techniques even further. Similarly, the agricultural extension education should focus on informing young people and established farmers about non-farm employment opportunities as well as on improving farm techniques.

4. *Payments and loans to underwrite the cost of transfer.* Compensation to owners of resources (in distressed areas) on which returns have been lowered as a result of technological change might include either direct payments or interest-free loans to defray the cost of

movement. Again, this step would not only facilitate movement of the individual to employment where returns on his resources would be greater but would also make for a greater national product.

The steps outlined do not necessarily provide for full compensation to individuals. For example, they include no payment to redress impaired value of capital assets such as land, buildings and machinery on which returns have been lowered or which have been made obsolete. They simply provide for minimum compensation consistent with public-financed technological improvement as an economic progress goal. If farm technological advance is to be justified in terms of general progress, it makes little sense to free resources and then leave them stranded even temporarily in agriculture. Compensation should focus, of course, on those resources where value productivities are lowered.

Additional Considerations

We have been unable to include many social aspects of technological improvement in one study. The analysis is entirely in economics. Even here we have unfolded only one of the many chapters which are possible. Some may suggest that the arguments put forth are in the agricultural fundamentalist vein. Quite the opposite is true: the analysis is in terms of minimizing (rather than maximizing per the fundamentalist) the input of resources for the "needed" output of subsistence goods.

The analysis might be termed "closed economy" although this objection is certainly removed in the sense that there is only one world economy and the conclusions apply equally on a world basis. Yet if one nation produces agricultural commodities to export and exchange for luxury commodities of other countries, the agricultural production in the first no longer falls in the subsistence category (too, the portion of agriculture as a luxury-exchange industry would have no prior claim over other luxury industries for public finance of innovations). Finally, agriculture might gain in real income (from innovations within agriculture) where innovations take place in the face of inelastic demands and lowered money income. This is true in countries where resources in non-agricultural industries are so few that luxury production can be organized on an "adequate" economy scale only by transfer of resources from agriculture. The case is a special instance of those discussed and would still require a diminution in value productivity (income) to some resources in agriculture.

ECA IN ACTION ON THE FOOD AND AGRICULTURE FRONT

OF all the interests of our government—political, financial, legislative, educational—there is not one which does not relate in greater or less degree to the progress of the European Recovery Program. Our realization of the inescapable bond between European and American affairs was implicit in the concept of the “Marshall Plan.”

Agricultural economists, of course, are most interested in the progress of the Food and Agriculture Division of the Administration. Decisions concerning problems in the agricultural sector of our own economy are dependent on the outlook and plans for agriculture in the rest of the world.

Agriculture's importance in the scheme of European recovery is shown by the Ninth Report of the Economic Cooperation Administration.¹ Of the total \$4566.7 million authorized through Feb. 28, 1949 for use by ERA, \$2157.3 million or 47.2 percent of the total was for food and agriculture commodities, including agricultural machinery. This report also gives the following breakdown of the food and agriculture expenditures:

Commodity	Authorization (millions)
Bread grains	\$813.9
Cotton.	358.6
Fats and Oils	225.8
Coarse Grains and Feed	157.8
Tobacco	120.0
Sugar and Related Products	106.8
Meat	79.0
Dairy Products	73.1
Fertilizer	33.3
Miscellaneous	119.8
Agricultural machinery, exclusive of tractors	38.4
Tractors (under 50 H.P.).	30.8

Even more significant and stimulating than these figures, however, are the stories behind the figures. What is the ECA agricultural program actually accomplishing in the cooperating countries? Are the adjustments in agricultural production in line with long

¹ Ninth Report for the Public Advisory Board, Economic Cooperation Administration.

time needs? What are the key agricultural problems and trends in these countries?

We know of no better source for such supplementary information than first hand accounts from the agricultural attaches and the heads of the agriculture divisions of the special ECA mission to each of the cooperating countries.²

The ECA story, of course, is different for each country, because each has its peculiar problems and its prospective solutions to those problems. But threads of continuity run through the reports from each of the countries; things which remind us that many of these agricultural problems are basic, not isolated nor belonging to only one country. There is the universal striving for increased production; the need for more machines and better methods; extension services that really reach the farmer; the necessity to restore trade, to balance imports by exports—these problems are the same for all.

Food imports have required most of the ECA funds allocated for food and agriculture in the first year of the Program's operation. But reorganization plans for agriculture are basic to the long term plan for achieving financial independence in most countries by 1952 when the Program is scheduled to end. In the later years of the program an increasing proportion of ECA funds are scheduled for machinery, fertilizers and other materials to boost agricultural production. As one reads the reports from the individual countries it is evident that the ECA program, in addition to its financial help, already has furnished the stimulus for a critical appraisal and drafting of long time plans for agriculture. There is little evidence as yet of integrated planning for the agriculture of adjoining countries (except for the Benelux Economic Union). Perhaps that will come later.

From England, the former citadel of free trade, we get reports of plans to increase home food production above the high wartime levels, utilizing economic incentives, government subsidies, and other government programs as a means of self defense in a chaotic economic world. France, with its traditional independent farmers and inefficient strip system of farming in many areas, is developing bold plans for a more efficient and larger agricultural production.

² Many of these men are members of our Association. They have generously cooperated with a special request from the editorial office by sending in brief on-the-spot accounts of ECA's program and problems in the food and agriculture field. These reports form the basis for this article.

Italy, with its pressure of population, is going forward with irrigation projects, introduction of hybrid seed corn, improvement of dry land farming and other plans both to increase the food supply and provide more employment on farms.

Bizonal Germany is faced with a shift from traditional livestock farming to the continued production of direct food crops. The reduction in livestock farming can be minimized if exports can be expanded to provide continued imports of feed stuffs. The lack of an effective extension service to take the leadership in an agricultural adjustment program in Germany comes as a surprise in view of the years of state planning in that country.

Denmark, Norway, Belgium and Luxembourg, with efficient farming systems before the war, need help to recover from the war, an opportunity to sell goods in world markets, and an accelerated rate of mechanization to make up for the time lost during the war years.

Austria suffers many of the same problems encountered in Bizonal Germany. Turkey presents an unusual situation in that here the urge for improvement in agriculture is not to reduce needed food imports. Long time plans for agriculture in Turkey are to build up an already important exporting industry.

The country by country reports follow:

*The United Kingdom**

What ECA is accomplishing in the food and agriculture field in the United Kingdom is, of course, necessarily related to what is happening in the whole economy. Except for a year or two here and there, not since 1820 has the United Kingdom produced and sold as much to foreign countries as she bought from them. The "invisible" income which always made up the difference—shipping, insurance, foreign investments and the like—suffered disastrously during the long years of the war. While the British are staging a comeback on many of the "invisibles," readjusting for the major contribution made by foreign investments—frequently as much as 20 percent of total imports—is a painful process. Hence the big gap in Britain's balance of payments. To help reduce imports, agriculture is called upon to produce more at home.

* Based on a report from E. N. Holmgreen and Paul Nyhus, ECA Mission to the United Kingdom, London; Report of the ECA Mission to the United Kingdom, Dec. 31, 1948, Volumes I and II.

The program calls for raising agricultural production 50 percent above prewar and 15 percent above the wartime peak. By 1952 Britain wants to reach approximately the following targets compared to 1936-38:

Commodity	Percent Increase
Grain.	85
Milk.	23
Eggs	31
Beef and Veal.	10
Mutton and Lamb	-15
Pork.	- 8
Overall	50

Overall agricultural output for 1948 is estimated at 130 percent of prewar.

The expansion program will involve the cultivation of about six million acres in grassland and the improvement of some two and a half million additional acres by drainage. Grasslands being converted to crop raising will have yields generally as high as the land presently under cultivation.

Further progress in the mechanization of British farms plays an important part in the overall program. British farms are already more highly mechanized than the average farm in the United States, and the farm machinery and equipment industry at the end of 1948 was producing at seven times its prewar rate, so the outlook is favorable.

Other aspects of the food and agriculture program include a further 20 percent increase in the use of fertilizer—already double the prewar consumption; improved farm credit facilities; and expanded research and educational projects.

Capital investment required to modernize and mechanize the existing plant and expand to the goals established is equivalent to about \$1.8 billion. This is only three and one-half times the value of the annual return in decreased imports, so the program will pay for itself quickly in terms of foreign exchange savings.

What is ECA's contribution to this program? It is, first, financing about 13 percent of British food and agricultural imports—that part of the imports which must come from dollar areas and which is beyond the dollar resources of the United Kingdom without assistance. This enables the United Kingdom to maintain a monotonous diet about two percent lower in calorie content than prewar. Cereals and dairy products are the major food imports

financed by ECA funds. Food alone comprised approximately 46 percent of ECA imports into the United Kingdom from April 3 to October 15, 1948, and is estimated at 33 percent of the total in 1948-49.

A second important specific contribution of ECA to the food and agriculture program is its financing of certain types of agricultural machinery and spare parts from dollar sources. This machinery is of a kind and type not made in Britain. Except for extra heavy tractors and a few other items, the British are rapidly increasing production of the machinery needed to supply their own requirements.

Some of the longer run questions and problems are: Is Britain turning her back on her old policy of being an industrial nation and buying foods in the cheapest world market? Is Britain overlooking the whole principle of comparative advantage? The answer to both questions is a weak and modified "yes." In the language of the report, "Unfortunately at the moment, food is not purchased with 'principles' of any kind; it takes dollars, pesos, francs, lire, kroner and the like. The recent war, world politics, current world economics and exchange difficulties have thrown our old friend 'comparative advantage' off balance. What to do *now* was a question that needed not only an answer but action as well. The British have answered by producing more because they couldn't at the moment buy more. They have also come up with a long time plan of producing still more. The plan is not rigid and, no doubt, will be subject to continual change."⁴

Few economists have found fault with the plan to increase the fluid milk, fresh eggs, potatoes, or even the 10 percent more beef, based on better pasture use. A good many, however, do raise questions about the extra four and one-half million tons of grain called for by the targets; a few also wonder how high incentives will have to go to gain the various production goals, and how much these floor prices and subsidies will cost if world food prices drop sharply.

*France*⁵

Before the war 85 percent of the food supplies of France was produced on French farms, and 70 percent of the imports came from overseas territories, mostly as fats, fruits, vegetables and feeds.

⁴ E. N. Holmgreen, *op. cit.*

⁵ Based on a report from K. J. Nicholson, Chief, Food and Agriculture Division, ECA Special Mission to France; and R. C. Desmond, Acting Agriculture Attache, American Embassy, Paris, March, 1949.

These supplies, together with wines and other alcoholic beverages, gave the French people an average caloric intake which was one of the highest in the world.

The war and a series of years of bad weather placed France's agriculture in a critical condition. Fertilizer was reduced, machinery was worn out from use or idle for lack of parts, horses decreased in numbers, fuel was not available for the few thousand operating tractors, and manpower was reduced. The drought of 1945, and the hard winter of 1947 followed by a summer drought, resulting in two of the worst crop years in a century, left France with a 200 gram bread ration and a total average consumption of only 2400 calories in 1947-48. Food was truly the major concern of everybody, furnishing part of the basis for continued black markets, inflation, political disturbances, and a heavy drain on national resources to keep the food situation in hand, even with very large imports from abroad.

During the first quarter of 1949, as a result of a very favorable crop in 1948, and continued help from abroad in the form of ECA aid, France appears to be slowly but constantly making progress on the road to recovery. However, the balance is still so sensitive that another poor crop or other economic setbacks could have very dire consequences.

Crop production in 1948 was 93 percent of prewar in relation to 80 percent in 1947, by far the largest part of the change being due to vastly improved weather. All types of livestock and poultry production are increasing materially. Individual rationing of bread has been dropped, prices of many agricultural commodities are easing, and black marketeering of food is disappearing. Significant surpluses of vegetables and potatoes have appeared. Major foods in short supply are milk, fats and meat, the first two still being rationed, but important improvement for all three is expected if feed grain imports are continued and another favorable crop year follows 1948.

ECA aid has had a large part in easing the food situation since it began operations. In the first few months this came in the form of bread grains to lift the bread ration from the low point it had reached in the early spring of 1948. Purchases of processed milk financed by ECA were intended to enable the French to meet the milk ration for children in the winter period of low production. Imports of vegetable oil-bearing materials and oils, that have

always been essential to the French economy were made possible by ECA. In the future, however, the means of increasing home food production will receive more emphasis than direct foods in the ECA program.

The ECA program in France operates within the framework of a four-year program and of yearly programs developed by the French Government as a member of OEEC (Organization for European Economic Cooperation). Present French plans call for increases of agricultural production by 25 percent above the rate of production in the second half of 1948. The increase is to be accomplished in part by an extension of the area in key crops, but largely by a sharp improvement in yields and a more intensive utilization of land resources. In particular, the yield of wheat is to be increased from a prewar average of 15 quintals per hectare to 20 quintals per hectare in 1952, and thousands of hectares now in pastures or natural meadows are to be converted to annual forage crops because of their higher yields. Total forage units available for feed, other than from straw, are to be increased by one-sixth.

In addition to a doubling of use of fertilizer, the program assumes that lime application by 1952-53 will have reached a rate five times that of 1938-39. Also, there is to be a rapid increase in supplies of tractors, other farm machinery and maintenance parts. A major program is planned to speed consolidation of small land parcels affecting two million of the 3.6 million hectares needing consolidation. A plan is also projected to regroup crops grown on the parcels not consolidated.

Further, the French program calls for the use of the principle of price guarantees to farmers as an inducement to necessary investment, and to the adoption of the improved techniques. In addition to investment by farmers from their own capital, large extensions of credit are to be made by the Government, and business firms serving agriculture are expected to invest heavily in the production and distribution facilities necessary.

The attainment of these goals would do much to solve France's problems. However, it is by no means certain that these goals can be attained within the period of ECA aid. In spite of the very favorable crop yields in 1948, first year performance is below the goals, and there are no indications yet that 1949 goals will be reached. Many of the parts of the program necessary to accomplish the goals are still in the planning stage, yet to be implemented.

The French have no adequate counterpart to the American action agencies administering programs to adjust individual farm production, to improve the facilities of production, or to supply farmers with the means of increased production and to demonstrate their best use. There are no county, community or individual farm goals, no county farm committees, no ACP payments, no government distribution of fertilizer, no Farm and Home Hour, and no soil conservation districts in France. Lacking personnel and funds, Departmental agricultural services are generally forced to limit their extension activities to a few demonstration plots and to speeches to farm groups. The major tool employed by the Government to adjust farm production in line with long-time needs is the guarantee of attractive prices for key crops, such as wheat, oil seeds, and sugar beets. Beyond this price support policy, governmental extension of credit, governmental encouragement of consolidation of parcels, and a few government subsidies for imported materials such as oil cake, custom largely determines what French farmers produce and the methods they employ.

For the economy as a whole, many major problems exist. France's most critical shortage is power. This results in a continued reliance upon manual labor and antiquated methods by American standards. This situation grows out of a long period of fear for their security as a nation and individual lack of confidence in the franc. Net investment was negative for many years. In agriculture it was retarded by lack of purchasing power prewar and a lack of materials in recent years. Those with francs want hard currencies or commodities which can be held or converted to cash easily as the changing value of the franc dictates.

As of March 1, 1949, prices were about 20 times prewar, with agricultural prices turning downward, while industrial prices show some indication of levelling off in face of increasing economic activity. Trade balances continue unfavorable, metropolitan exports to foreign countries being only 46 percent of imports from those countries in 1948. From this latter situation is created the principal question confronting all French planners, namely, how to earn more foreign exchange, particularly dollars, and how to obtain what is needed from abroad without having to pay for such imports in dollars. France, like the United Kingdom, is embarking on a major program of expanding home food production because she cannot sell enough abroad to take care of her food needs.

Italy⁶

The ECA program in Italy also has as its first objective increased production. This is to be accomplished by improving the unit yields and extending the productive cropping areas by reclamation, irrigation and land improvements; by shifts in land use to a more intensive agriculture and a higher utilization of the land and labor resources of the country; and by modernization of Italy's agriculture commensurate with her practical, physical and economic limitations. In addition the program is striving to raise the standard of rural living by providing roads, schools, utilities and houses in large areas woefully lacking in these facilities; and to broaden the base of land ownership to attain in a measure at least an improvement in the social problems which weigh so heavily on Italy.

Positive action on many fronts is directed toward fulfillment of these objectives, and the ECA program is used to accelerate the long-time trends. There will be a gradual shifting away from the over-emphasis on grain to a more intensive agriculture. Cattle will be gradually increased; the production of dairy products stepped up by herd improvement. Of particular interest is the good start which has been made in artificial insemination with 10 percent of the dairy cows already bred by this method. Vegetables and fruits will certainly be increased.

An extensive irrigation and reclamation program has been implemented under which three and a half million acres will be reclaimed and improved—and irrigation provided for 1,300,000 acres. Work is ready to start on many projects which will bring improvements in production as early as 1949. Work will be provided for 150,000 men for the next year. Production in dry farming areas will eventually be increased by 30 percent and on land where irrigation is provided, by 200 percent.

The implications of such a program are far-reaching. It means a great transformation of large areas now undeveloped. The gains will be not only economic but social. It will result in agriculture absorbing more people, important because over-population is a major problem. It is estimated that after the improvements are made there will be an average increase in employment from 40 work

⁶ Based on reports from Harry McClelland, Chief of Food and Agriculture Division, ECA Special Mission to Italy, Rome, February, 1949; and Howard R. Cottam, First Secretary of Embassy, and Robert A. Brand, American Embassy, Rome, February, 1949.

days per year per hectare in the dry farming areas, up to 200 work days per year per hectare on irrigated land.

Much of this work will be done in the south of Italy, in Sardinia and Sicily where the need is great. The ECA Mission has already examined in the field, prepared reports and submitted recommendations on twenty such districts. Plans are ready and work should start at once. The examination on the ground has been made in great detail by the Chief of the Division and by the Reclamation and Irrigation Specialist. Every canal, dam, road or flood control project has been passed upon—out of this has come a fine cooperation with the Italian government.

Another interesting development is the introduction in Italy for the first time of hybrid corn. Two thousand tons embracing 16 varieties of American hybrid, tested and found suitable for Italy, will be planted (last year 40 tons were used). The results obtained have been spectacular, with yield increase up to 86 percent over local varieties, with an over-all average well above 50 percent. For 1949 this should bring about an increase of 150,000 tons in corn production.

This represents the initial stage of a long range development which may culminate in Italy producing the hybrid seed corn for all of Europe. All of this is being done with direct assistance of ECA finances. When it is realized that over three million acres in Italy are planted to corn each year, the possibility of extending production of hybrid corn opens up new possibilities for livestock expansion and increased supplies for manufacturing.

Other experimental work along practical lines has been implemented by ECA. A top flight agronomist will study in the field the best way to adapt new crops to the great areas to be improved. Helicopters purchased with ECA dollars will be used to fight the dacus fly which does millions of dollars damage to the olive crop. ECA assistance is being given to rebuild a more vigorous extension service upon which will rest the sustained progress of Italian agriculture. Schools of instruction to farmers will bring to them for the first time some fundamental principles of new and modern husbandry and open up to them vistas of the new agriculture. A fund is provided to assist and help the individual make necessary improvements on his own farm; the small farmer will be helped to become an owner under current government plans.

ECA assistance given Italy in the form of large imports of foodstuffs, and increased domestic production has resulted in marked improvement in the food situation. Controls on all foods except a portion of cereals have been eliminated; that is, consumers are assured rations of 200 grams of bread and 100 grams of pasta per persons per day. Additional bread and pasta are available on the free market at prices only slightly higher than those of comparable rationed products. Foreseeable imports of breadgrains from the U.S., Argentina, and Iron-Curtain countries are sufficient to meet Italian consumption requirements until the new harvest.

One of the most important current problems of food distribution is the inadequacy of domestically produced fats and oils due to the very poor 1948-49 olive crop. The government has taken steps to solve this problem by contracting for 47,000 tons of edible fats and oils during the first half of 1949, in order to avoid the danger of price increases, particularly of olive oil.

The report from Italy closes with a thought common to most of the reports, "American agricultural economists may be interested to note that it is becoming increasingly evident that in the years to come Italy, and as a matter of fact all European countries, are going to buy where they can sell. That is axiomatic—and if the United States is to maintain its trade in agricultural commodities in a highly competitive market, it must revamp its trade policies to permit Italian goods freer movement. Otherwise Italy will look to the Argentine and to the East for her wheat and fats and oils and to other areas where Italian products are purchased."

*Bizonal Germany*⁷

The greatest problem facing Western German agriculture today is that of increasing production to provide for a refugee-expanded population 20 percent larger than prewar; and to offset as far as possible the loss of the highly productive areas east of the Oder-Neisse Line. This means a greater intensification of production, a shift to direct food crops with higher calorie yields per hectare, increased imports of fodder, and a limited production of livestock and livestock products for domestic consumption. It seems unlikely that the high prewar rate of consumption of meat, fat, and other

⁷ Based on a report from Paul Quintus, Bipartite Control Office; Food, Agriculture and Forestry Group, Frankfurt, Germany, March, 1949.

animal products will be achieved in the foreseeable future. On the contrary, the German diet will probably consist largely of cereal and vegetable products for an extended period.

Thus the agricultural policy aims not only at increasing production but developing a much more intensive type of farming and better crop rotation. The root crop area should be expanded considerably, and the area under pulses and oil crops is to be expanded, both as a means of soil improvement and to provide edible fat and oil cake for the cattle. These adjustments must be made at the expense of fodder grain and grasslands, however; a course of action squarely opposed by the farmers' strong determination to hold to the traditional farming pattern of livestock farming. It will be exceedingly difficult to keep livestock numbers in balance with available fodder supplies. So long as adequate fodder is imported the results need not be unfavorable. But if fodder imports are too small, home grown grains needed for direct human consumption will be fed to livestock and poultry. This is the reason every effort is being made to increase the availability of fodder grain and protein concentrates with ECA funds and through trade agreements.

ECA contributions to the bread grain program and direct fodder imports have greatly improved domestic butter production and have permitted an expanded hog raising program. In the first instance, better bread grain supplies have made it possible to lower the extraction rate for flour with increased milling residue for dairy cattle. This residue, oil cake from imported seeds, and imported feed concentrates coupled with a heavy crop of indigenous fodder during 1948 resulted in a sharp recovery in milk production this past winter. The combination of larger fat imports with ECA funds and stimulated domestic fat production have permitted an increase in the monthly fat ration for the normal consumer from 125 grams in March, 1948 to 750 grams in March, 1949.

A correlated problem facing agricultural planners in Western Germany is lack of the technically well-trained farm population necessary to maximize production. At present there are only six agricultural colleges in the Bizonal area, which has an estimated five million farm population. In June, 1948, these colleges had a combined enrollment of 2,700 student which was considered exceptionally large. The German agricultural education system is especially deficient in facilities for bringing the results of agricultural

research to farmers. A tentative request for 30 million dollars of ECA funds has been made as the minimum amount necessary for bringing about the desired improvement and expansion of agricultural teaching, extension and research facilities.

While most food and agriculture controls are still in effect in Western Germany a transitional period of relaxation and elimination of such controls is giving rise to new problems. A particularly serious problem which agricultural economists may be interested in watching is that of adjusting domestic agricultural prices to world price levels. For the fiscal year 1948-49, for example, it is estimated that wheat imported into Western Germany will cost \$109 or 363 DM per metric ton as compared with a domestic wheat price of approximately 250 DM per metric ton. Comparable prices for coarse grain are 283 DM per metric ton for imports and 190 DM for domestically produced coarse grain. In the case of sugar the situation is reversed, with imported sugar 370 DM per metric ton as compared with a fixed price of approximately 475 DM for domestically produced sugar. A decision will have to be made as to whether the prices of these and other commodities are to be permitted to rise or fall to world price levels, or whether they are to be controlled independently of world prices by means of subsidies, import duties, equalization schemes and other devices.

Although the direct expenditure of ECA funds in Bizonal Germany has been relatively small, this cannot be taken as a true measure of the role which ECA funds are playing in the recovery of Western Germany. It is largely due to the existence of these funds that the export trade of the Bizonal Area is able to finance urgently needed food imports.

Much of the gain from ECA activities is intangible and even psychological. In any case the export trade is rapidly climbing to a level which will enable Germany to finance to an ever increasing degree the food imports needed to maintain and improve a scale of nutrition which a year ago seemed out of reach.

Denmark³

In contrast with most other European countries, no major changes are contemplated in the pattern of Danish agricultural production in the long-term program. By and large the agricultural

³ Based on a report from George L. Peterson, Agricultural Officer, ECA Special Mission to Denmark, Copenhagen, February, 1949.

goal is to restore prewar production. The combined tonnage of milk, beef and veal, pork and bacon, eggs and poultry meat projected in the long-term program is approximately seven percent greater than prewar production.

Before the war, Denmark exported 83 percent of its butter, 66 percent of its bacon and 70 percent of its eggs. In order to export the largest possible volume, domestic consumption of butter, margarine and pork is held down by tight rationing. From a food standpoint, the Danes enjoyed a much higher standard of living during the war than now, because they could not export to England and they delivered as little as possible to Germany.

The end objective of Danish agriculture is to produce butter, bacon and eggs; all other agricultural production is of secondary importance or an intermediate step. To produce the maximum amount of butter, bacon and eggs, Denmark has always imported a large amount of feeds, mostly from dollar areas. Because these imports were not available during the war, cow numbers fell to 85 percent, pigs to 38 percent, and chickens to 38 percent of the prewar average.

In 1948 milk production was back to approximately 77 percent of prewar; butter production 66 percent of prewar, bacon and pork production 52 percent and eggs 79 percent of the prewar output. It is too early to measure the effects of imports of feed stuffs on the output of livestock products, but the number of cows at the end of 1948 was 63,000 above the same date in 1947, and pig numbers were roughly 500,000 more on December 31, 1948 than on July 1, 1948. A good 1948 harvest and the import of oil meals and oil seeds with ECA assistance account for increases in production.

In connection with imports of oil meals, however, a distinct effort is being made to reduce the amount of oil cake used in relation to prewar use. The use of coarse grains and silage from root tops is to be increased. The change is an effort to decrease the need for dollars for oil seeds and oil meal imports.

ECA assistance is particularly helpful in purchasing tractors and tractor machinery. Denmark is today in about the same stage of mechanization as the United States in the early 1930's. There are altogether too many horses for economical production. Before the war there were about 4,000 tractors; there are now between 8,000 and 10,000. As a result of imports of farm machinery the number of farm machinery stations—most of them private farmers

—who do custom work for the small farmers, almost doubled in 1948. There were 425 such stations at the last count. About 1,700 tractors from the U.S. will come in under the 1948-49 program and about 2,500 in the 1949-50 program.

A trend in Denmark's agricultural policy of particular interest to agricultural economists is the political pressure to increase the number of small farms (under 25 acres) at the expense of the larger farms. At present, Danish farms average 38 acres, the largest in Europe with the exception of England. As a result of legislation in 1899 and 1919 providing government assistance for the establishment of small holdings, the average size of Danish farms went down about $3\frac{1}{2}$ acres. At present, consolidation of two or more farms into a larger unit is prevented by law.

Another matter of particular interest is the dairy industry. There are in Denmark (16,600 square miles in area) approximately 1,600 dairy plants, of which somewhat more than 1,300 are cooperative. Most of the milk is delivered by horse and wagon. The management is aware that costs of production can be reduced by truck delivery to larger plants. It is intended over a period of years to reduce the number of creameries to somewhere between 300 and 400.

Restoration of trade is particularly important to Denmark. The United Kingdom is still the most important market for Danish butter, bacon and eggs, but substantial amounts have also been sold to Sweden, Russia, Belgium and Finland, and even 5,000 tons of butter to Canada. Prewar, 24 percent of Denmark's agriculture exports went to Germany, and restoration of that trade, particularly with the Bizonal area, is aimed at. Denmark would also like to export butter (primarily) cheese and pork products to the United States. Denmark must obtain dollars to purchase feed supplies (oil seeds or meal and coarse grains) which are available almost exclusively in the dollar areas. Unless she can export to the U.S. or the United Kingdom can provide convertibility, economic solvency by 1952 cannot be foreseen.

Belgium and Luxembourg⁹

Belgium and Luxembourg are returning to their prewar pattern of intensive farming, and this course is undoubtedly in line with long-time needs. ECA is making it possible to import sufficient

⁹ Based on a report from Jerome T. Gaspard, Agricultural Attache, American Embassy, Brussels, February, 1949.

foodstuffs for Belgium and Luxembourg to maintain their food consumption close to prewar levels. It has also made possible some very limited imports of agricultural machinery, and it is hoped that ECA will finance substantial imports of feedstuffs to make possible a restoration of prewar levels of production of livestock, dairy and poultry products.

In addition to continued good weather, the chief requirement of Belgian agriculture is the importation of sufficient supplies of feed grains. With the world grain shortage, world grain exports have been used almost wholly for human consumption, and Belgium has not found it possible to import normal feed supplies. As a result of the large 1948 corn crop in the U.S., the resumption of normal feed imports should soon be possible.

The most important problem facing Belgian and Luxembourg agriculture is that of making the necessary adjustments to meet the Dutch competition which will be felt under the Benelux Economic Union. Under the agreement of May 9, 1947, the three participating countries agreed that each country could limit its imports of agricultural products from its partners if the prices of such imports were below certain minima established by the respective countries. This agreement was specifically designed to prevent Dutch dumping of agricultural products in Belgium and Luxembourg. The Dutch costs of production are lower than those of Belgium and Luxembourg, and these two countries will be forced to take every possible measure to lower costs.

In this connection, there is no doubt that it would be desirable for Belgium to mechanize much more than it has to date, but several factors are operating to retard mechanization. There is currently considerable unemployment in Belgium and there is therefore no shortage of farm labor to create pressure for mechanization. In addition there is a tax on tractors, and a very high tax on gasoline. This high tax makes it economical for Belgian farmers to keep horses and oxen, which often eat up half the produce of small Belgian farms. According to the May 15, 1948 census, Belgium had only one tractor for every 100 farms.

The Belgian dairy industry requires considerable improvement at all stages: on the farm, in the processing plant, and in the distribution sector.

Although the Boerenbond (Farmers' League) has a highly developed extension service for its members, the extension service

of the Ministry of Agriculture is quite inadequate, and there is no effective means of passing on information from the agricultural colleges to the individual farmers. This is of particular importance in view of the Benelux Economic Union, and the highly effective Dutch extension service.

Despite the generally favorable economic situation there are disturbing factors: unemployment has risen to about 250,000 and prices are high, about four times the prewar level. It appears that 1949 will be for Belgium and Luxembourg a year of readjustment.

*Norway*¹⁰

Long-term agricultural plans in Norway worked out in connection with the ECA provide for increased efficiency in Norwegian agriculture. The program emphasizes crops best suited to the soils and climate, for instance the production of feed crops for the expansion of the dairy and sheep enterprises. It also stresses more pronounced grassland farming, with greater production of pasture and hay, and conservation in the form of grass silage, all to expand the production of animal products without too great imports of feed stuffs and concentrates.

Economic assistance to Norway by ECA has been of benefit to her agricultural program indirectly by financing raw materials and machinery imports required for reconstruction. This contributed to maintenance of full employment, which meant that the strong home market for farm products has been maintained. This maintenance of the home market may not be of greatest importance at present when the production of Norwegian farm products, mainly livestock products, is too small to satisfy the demand, but as production increases the maintenance of the home market becomes very important indeed.

As related to agriculture more specifically, Norway normally imports 80 percent of its bread grains, all of which have been financed by ECA since the beginning of the program. ECA has made it possible to import some concentrate feeds, even though the level of imports are still too low for full utilization of the productive capacity of Norwegian livestock.

There is a scarcity of agricultural labor, and the greatly increased cost of that labor creates an unprecedented demand for farm

¹⁰ Based on a report from Einar Jensen, Agricultural Attache, American Embassy, Norway, March, 1949

machinery. There is, for example, a considerable demand for tractors—and no production of tractors in Norway. Were it not for the ECA assistance, only British tractors, not heavy enough for many Norwegian conditions, could be imported. Thus, ECA has speeded up mechanization and helped to provide machinery better suited for Norwegian conditions.

Also as a result of the ECA program, many more agricultural scientists from Norway are going to the United States for study. After the isolation from other countries suffered during the war years, there is a great need for such study abroad, with all the stimulation of ideas and work it involves.

*Austria*¹¹

Austria, like Western Germany, has problems complicated by occupation. Austria is occupied by four powers, and food and agricultural supplies were furnished by the four occupation powers, by UNRRA, by Congressional aid and by interim aid, before the start of the ECA program. The big difference that can be noticed under the ECA program is the emphasis upon the rehabilitation phases of the food and agriculture policy, as compared to the dominance of relief assistance under the previous programs.

Livestock enterprises, especially the heavy grain-consuming hogs and poultry, suffered great decreases during and following the war because of complete lack of imports of feed stuffs and continued droughts. Under the ECA program feed supplies are being imported into Austria to supplement the increased production of 1948, so that livestock may be increased.

Long-time objectives for Austrian agriculture emphasize livestock—especially dairy cattle, which can effectively utilize the areas primarily adapted to grass production. The rough terrain and heavy rainfall makes many of the areas especially adapted to grass production.

Heavy applications of fertilizer are badly needed for both grass and crop areas. Phosphate and potash fertilizers are being imported under the ECA program in as large quantities as the farmers are able to buy. Likewise, supplies of seeds and other items necessary for increased production are being imported in quantities.

One of the big problems in carrying out the expanded agricultural

¹¹ Based on a report by W. S. Middaugh, Food and Agricultural Office, ECA Special Mission to Austria, and coordinated with Agricultural Attache.

program in Austria is price relationships. Great emphasis has been placed on price stability, and price-wage agreements between labor and the other elements of the economy have been reached only after protracted discussions, with agreement coming at about harvest time, rather than before planting time, which would be desirable to stimulate increased production. This lack of forward-looking price and the general philosophy that the agricultural sector of the economy fared well during the war and should now make sacrifices in order to maintain price stability, has meant that the agricultural production program has not had the desired impetus, and has not gone ahead as fast as would have been possible under more favorable circumstances.

Turkey¹²

Turkey's problem is also one of increasing production, not for home consumption, however, but for export. Turkey is at present self-sufficient in agriculture commodities and they have in the past made up approximately 90 percent of her exports.

The long-time agricultural program calls for increase in production of cereal crops, cotton, oil seeds, pulses, livestock and livestock products, and others. However, little or no consideration has been given to the development of the program from a standpoint of land use or over-all planning. It has been developed mainly commodity-by-commodity and there is need for a well-balanced agricultural mission from other countries to review the plan before it is finally adopted.

Turkey has only slightly over 6,000 farms that are 125 acres or more in size (with the exception of 13 large state-operated farms). In spite of this, 85 percent of the population is engaged in agriculture. Most of the farms are very small and crops are raised with nothing but hand tools. Very crude plows, many made of wood, and little or no equipment, insecticides, fungicides, are used on Turkish farms. Anything that can be obtained under the ECA program that will make it possible to improve tillage, plant crops at the proper time, prevent disease and destroy insects, and harvest and store crops properly, will materially increase total production and augment exports.

The ECA program, if carried out as planned, should increase

¹² Based on a report from Charles R. Enlow, Agricultural Attache, American Embassy, Ankara, February, 1949

production tremendously, particularly in an undeveloped area of virgin wheat land of several million acres. Tractors and farm machinery are being obtained under ECA to develop this area. There are now 13 state-operated farms of approximately 700,000 acres in this area that have been in operation from three to four years. These farms have proved conclusively that the production of wheat and other crops by dry land farming is not only possible but practical. One of these farms, about 70 miles from Ankara, in a 17-inch rainfall belt, had 26,000 acres of wheat last year that produced 35 bushels per acre.

There is also a large acreage in Turkey suitable for gravity irrigation, and other extensive areas that show possibilities for pump irrigation. Turkey is a country of winter rainfall and any irrigation that can be carried out increases production tremendously. Under the ECA program, Turkey hopes to acquire well-drilling equipment, irrigation pumps, assistance in constructing dams, and technical assistance.

The problems in Turkey of primary interest to agricultural economists are principally the possibilities of increased trade. Turkey has many products including strategic minerals that are in demand in the United States, and production can be greatly increased. As far as agricultural products are concerned, the main problem is for the Turks to improve the quality of the products and establish a name for their goods. If these things can be done, it will be possible for Turkey to increase her exports to the United States and narrow the gap between her imports and exports.

NOTES

RELATION OF METHOD OF ACQUIRING FARM TO PRODUCTION FACTORS IN COTTON FARMING

SINCE the war increasing attention has been given to the problem of maintaining the continuity of farm operation between generations. It is an issue that has vexed land economists in this country for some decades because farm tenancy and scale of operations are involved. The thought has been that if farms can be passed on to the next generation systematically, the benefiting son or son-in-law would be attracted to farming as an economic opportunity at a comparatively early age. This would tend to reduce absentee landlordism and therefore tenancy. From the standpoint of economy of operation, farms passed on intact avoid parcellation and a size, layout and location generally uneconomic to operate. Furthermore if the farm passes to the next generation anti-mortem, considerable decline in productivity of the farm may be avoided.

Although there are many variations, the central theme of these experiment station bulletins and extension circulars has been the advocacy of a father-son arrangement by which the two would operate the farm jointly until the death or retirement of the elder man, when the farm would pass by inheritance according to previous agreement wholly or in part to the younger man. These are well meaning intentions but certain relationships which have turned up in a recent study¹ suggest that, if the same findings hold true for other segments of the agricultural economy, such an arrangement may mean less to agriculture than generally believed.

The farms in the study referred to were obtained by conventional sampling methods from 9 counties² in the Upper Piedmont of South Carolina and Georgia. In all 988 farms were obtained in this region³ but only 624 farms had a production history of sufficient

¹ The study referred to, still in process of analysis, is a cooperative study of cotton yield variability between the University of Virginia and the Bureau of Agricultural Economics, Division of Agricultural Finance, Ralph R. Botts and E. Lloyd Barber, collaborators. Acknowledgment is made to the General Education Board for a grant in support of the project.

² Greenville and Pickens counties, South Carolina, Carroll, Clarke, Cobb, Douglas, Haralson, Jackson, and Madison counties, Georgia.

³ A second sample of about 750 farms was obtained from West Texas but the data are not yet in a sufficiently advanced stage of analysis to make a similar study of inheritance as here described.

TABLE 1. COMPARISON OF SPECIFIED OPERATOR CHARACTERISTICS, PRODUCTION FACTORS, AND YIELD AND YIELD VARIABILITY DATA ACCORDING TO METHOD OF ACQUIRING FARM

(Based on 376 white owner-operators, males, from the Upper Piedmont)

Items	Farms reporting 3 or more years of yields, 1938-46	
	Acquired by inheritance ^a	Acquired by purchase
Number of farms	59	317
Average acres of cotton harvested	15.6	16.3
Operator's characteristics:		
1. Years of schooling	8.3	7.5
2. Age in 1946	53	55
3. Experience growing cotton on 1946 farm	24	18
4. Percentage of operators engaging in off-farm work in 1946	33	27
Farm practices for period (3 or more years between 1938 and 1946):		
1. Average fertilizer applied (in 100 lbs)	4.9	5.2
2. Ratio of legume acreage harvested to cotton acreage	0.88	0.84
3. Percent of cropland in cotton	26	26
Percentage of farms in 1946 in severe erosion class ^b	30	22
Percentage of operators reporting:		
1. Farms operated with cropper labor primarily	36	27
2. Seed cleaned and/or treated regularly prior to planting	54	65
Farms reporting 3 or more years of yields, 1938-46		
1. Average yield	304	332
2. Average coefficient of variation	27	27
Farms reporting 8 or 9 years of yields, 1938-46.		
1. Number of farms	32	157
2. Average yield	313	351
3. Average coefficient of variation	27	25
4. Trend in yield, lbs. yearly	3.6	6.3

^a Farms were considered as inherited if over 50 percent of the existing 1946 farm was so acquired.

^b Based on judgment of enumerator, who was generally an employee of the county AAA office.

duration to give 3 or more years of yields. Comparative data according to two methods of acquiring farms for a homogeneous class of owner-operators are given in Table 1.

The data show that the operators of purchased farms, 317 in all, obtained 28 pounds more of lint cotton per acre for an average of 3 or more years during 1938-46 than those operators (59) who inherited their farms; there was no significant difference in variability of yield for the period. Increasing the number of years included in the yield average improved further the margin in

favor of the operators of purchased farms. Among the farmers in this group who purchased the farm which they were operating in 1946, 157 reported 8 or 9 years of yields in the 9-year period from 1938 to 1946. There were 32 comparable farms which had been inherited by their operators. As shown in the table the operators of purchased farms averaged 38 pounds or 12 percent more of lint cotton per acre during this longer period than did the operators of inherited farms, and had 7 percent less yield risk as measured by the Coefficient of Variation. Furthermore, the former were improving their yields at a more rapid pace than the latter, the yearly upward trend averaging 6.3 pounds as compared to 3.6 pounds of lint per acre.

Further examination of the data shows wherein the operators of purchased farms were superior and inferior to those of inherited farms. It is apparent they are not greatly superior in the production factors, certainly not sufficiently so to explain the yield differentials. Although a higher percentage of the inheritors occupy more severely eroded farms the differences are not great otherwise. The purchasers used 30 pounds of fertilizer more per acre and had a somewhat better record as regards treating and cleaning of planting seed but again these factors, and even taking into account the somewhat less erosion, probably are not sufficient to account for the higher average yield of those farmers who purchased, especially when the favorable factors of more education and younger average age of the inheritors are taken into account. Some of the difference must be due to entrepreneurial ability and conditions under which the two classes of farms are operated.

The conditions under which farms are acquired by inheritance may be, for analytical purposes, divided into two major categories—those left in the natural course of events to the non-resident child, and those farms left as consideration for the child's having remained on the farm.

Farms may pass by inheritance to city relatives or to farmers of the same type who live in the community or on an adjoining farm. In the former case the inherited farm would as a rule be operated as a tenant farm, and the effects on yields and yield risk would be those of typical tenant-operated farms with uncertain tenure. On the other hand, if the heir resides in the community, or on an adjoining farm, he would have the familiarity and interest in farming as a profession to capitalize on his good fortune. Such

farms would be expected to show up more favorably in yield and yield risk than other classes of farms.

Where the farm is bequeathed as a reward for the child's remaining on the farm, although the factor of interest can be reasonably assumed, the operator is more probably of lower inherent entrepreneurial ability and less maturely developed in the little he has than the typical owner-operator who purchased his farm with money saved or raised through some financial institution. While the purchased farm reflects the owner-operator's likes and judgment in its selection, the inherited farm shows neither. Obviously, those who inherit farms through this sequence of events would be expected to be less bold and energetic than their brothers who acquired land by other means, or left the business of farming altogether to find city employment. Furthermore, their entrepreneurial development would be hindered by the domination of the older generation, which would often prevent them from reflecting the alertness and progressiveness of their age in farm operation. On these farms this means that by the time the father passes out of the picture, the younger man often will have passed his physical prime and have become set in the ways and methods of a generation once removed.

Among the 59 inherited farms included in the analysis 18 operators had acquired considerable experience on the farm inherited prior to becoming its operator, 41 had not. The operators with experience on the farm prior to inheritance averaged 40 pounds or 13 percent less lint cotton per acre than the operators reporting no previous experience on the inherited farm. There was no significant difference in yield risk, but considering only those farms with 8 or 9 years of yields during the period, it is found that the inheritors with previous experience on the inherited farm had on the average a downward trend in yield of 4 pounds of lint cotton annually in contrast with an upward trend in yield of 6 pounds yearly by the inheritors with no previous experience on the inherited farm.

Although the number of operators with previous farming experience on the inherited farm is somewhat small for the significance desired, the results afford considerable support for the thesis, advanced above, that the son who remains on the farm with his father is more likely to be low in certain entrepreneurial abilities and have less chance for development of them than the son who strikes out on his own.

These relationships may not be applicable to those types of farming where a very high order of intellectual ability is required, and where frequent and important changes of technique occur. Both conditions would tend to produce progressive entrepreneurs in both generations. Also, irrespective of type the operators of large farms may and frequently would be sufficiently progressive to give the heir selected a free hand and to create opportunities for his entrepreneurial development. The author of this article is informed, however, that a very large Mississippi Delta plantation operator recently requested an only son upon his graduation from college to seek employment elsewhere until the farmer's certain retirement when the latter would return and take full control. The entrepreneur in question obtained his farm the hard way and is one of the most successful farmers in the Delta. He apparently is convinced that two lights shine less sharply together than either alone.

Certainly, maintaining continuity of operation between generations is quite desirable and a worthy objective if it can be accomplished without lowering the quality of farm operators and reducing the general level of efficiency of the agricultural economy as a whole. It seems necessary, however, if the above results are found to prevail in the other major segments of agriculture, that the second generation come into the picture as completely as possible in every respect. But such is not in accord with the traditions of American agriculture. The older generation insists upon staying in the picture and too frequently in a cramping and often dominating position, so that there's confusion as to who is in charge and hesitancy, delays, and half-measures in the control and in the making of progressive changes. What is needed is an effective retirement system which will get the older generation off the feet of the younger generation. In general retirement is not within the reach economically of the vast majority of farmers. But extending the Old-age and Survivors Insurance benefits of the Social Security program to farmers would help. Even this plan would not be completely successful because of the very modest scale of benefits. It would be more successful, however, if some plan could be devised by which a part or all of the retiring farmer's equity could be recovered and joined with the Social Security benefits in the form of an annuity for the remainder of his life and that of his spouse when she survives. If coupled with a farm or village housing plan which

would enable retirement to the place of their choice, either on the home farm at non-interfering distance from the farmstead or in a favorite nearby village, the aged in agriculture would have not only security to look forward to but also comfort and independence, while agriculture would have an efficient and sensible solution to a troublesome problem, one which along with many other factors keeps the industry working at less than its maximum efficiency.

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ACCURACY OF LIVESTOCK PRICE FORECASTS AT KANSAS STATE COLLEGE

MONTH-to-month forecasts of livestock and grain prices have been made by staff members of the Department of Economics and Sociology of Kansas State College since 1925. These forecasts appear monthly in a printed publication entitled "The Kansas Agricultural Situation."

Difficulties in Measuring Livestock Price Forecasts

The principal difficulty confronting an analyst who attempts to measure the accuracy of a monthly price forecast is the lack of a standardized terminology to describe accurately the three dimensional variables of direction, timing and magnitude of price change. Such terms as "higher," "stronger," "steady to moderately higher," do not permit accurate statistical measurement.

The forecasting of livestock prices is not an exact mathematical science. Although analysis of historical, statistical data plays a prominent part in forecasting, such a procedure usually serves to give the forecaster only a rough indication of the effects of the various measurable factors influencing livestock prices, rather than to provide a definite answer regarding the exact price to expect.

Once the forecaster has determined the importance which he should attach to the various statistical indices, the problem of forecasting becomes that of keeping abreast of new or unusual developments in the commercial, political, and agricultural situation, and then properly evaluating the effect which these developments will have on price.

Method of Determining Accuracy of the Forecasts

Since an important element of uncertainty in the measuring of the accuracy of these forecasts was the determination of a quantitative meaning to be attached to the various terms used in stating the forecasts, an arbitrary statement, based on estimates of men engaged in making the forecasts, was prepared.

In preparing this score table (Table 1) it was decided that it would be illogical to hold the forecaster to an exact percentage

TABLE 1. SCORE TABLE FOR MEASURING ACCURACY OF PRICE FORECASTS

Forecast	100 percent	Score 66 percent	33 percent
	Percent change in price		
Substantially higher	5% or over	4% or over	3% or over
Higher	4% or over	3% or over	2% or over
Moderately higher	3 to 7	2% or over	1% or over
Slightly higher	2 to 6	1 to 7	0 or over
Steady to higher	1 to 5	0 to 6	-1 to 7
Steady to moderately higher	0 to 4	-1 to 5	-2 to 6
Steady to slightly higher	-1 to 3	-2 to 4	-3 to 5
Steady	-2 to 2	-3 to 3	-4 to 4
Steady to slightly lower	-3 to 1	-4 to 2	-5 to 3
Steady to moderately lower	-4 to 0	-5 to 1	-6 to 2
Steady to lower	-5 to -1	-6 to 0	-7 to 1
Slightly lower	-6 to -2	-7 to -1	0 or lower
Moderately lower	-7 to -3	-3 or lower	-1 or lower
Lower	-4 or lower	-3 or lower	-2 or lower
Substantially lower	-5 or lower	-4 or lower	-3 or lower

change for the meaning of each term, and in view of this a rating table was constructed which allows a certain range in the meaning of each forecasting term.

Each month's forecast was scored on the basis of the actual price movement during three ten-day periods of the month. The object in dividing each month into these three periods was to allow some credit for a forecast which may have been correct the first ten or middle ten days of the thirty-day period for which these forecasts are made, but which became inaccurate during the latter part of the month. Since these forecasts are intended to extend over a thirty-day period, and since more credit should be given for a forecast that was accurate throughout the entire month, an arbitrary weight of one was assigned to the score of the first ten-day period, two to the second, and three to the third. The later periods of the month were thus more heavily weighted. Having determined

the percent price change represented by each forecasting term, and the weight to be assigned to the accuracy for each ten-day period of the month, it was a simple procedure to score the accuracy of the monthly forecasts. Having scored each ten-day period, the weighted scores were averaged for each month, and a yearly average taken.

Accuracy of Hog Price Forecasts

During the period 1925-40, hog price forecasts made at Kansas State College averaged 64 percent correct.

A study of the seasonal variation of the scores of the actual forecasts shows a distinct seasonality in the accuracy of the predictions. The least accurate months were August (47 percent) and April (50 percent). The month during which the forecasts were most accurate was November, scoring 77 percent.

It was recognized that the arbitrary scoring table and the varying weights would affect the score obtained. Therefore, the calculated score was measured against a score obtained by using the average seasonal price variation as the only basis of the forecast. This forecast was based on the average seasonal price movement for 200-250 pound good-to-choice fat hogs at Kansas City during the period 1922-38. The average accuracy of the forecast based only on the seasonal price variation was 37 percent. This indicates that the hog price movement during an individual year differed considerably from the average seasonal pattern.

Having obtained the scores on both the actual forecasts and the forecast based on seasonal price variation, it was then possible to calculate an index which would show the extent to which the effects of factors other than the average seasonal price movement had been correctly estimated. On the basis of this index it was found that the actual hog price forecasts averaged 72 percent more accurate than the forecasts obtained by using only the seasonal price movement.

The objective evaluation of the hog price forecasts indicated an average accuracy of 64 percent. The forecasts were more useful than the score indicates. When these forecasts are scored only on the basis of whether or not they indicated the general direction in which the price moved, a somewhat better result is obtained, the forecast being accurate 69 percent of the time.

For purposes of comparison, a study was made of the accuracy that would have resulted if the forecast had been based on a

continuance of the trend as indicated by the previous thirty-day period. When the previous thirty-day period was used as the basis for forecasting an accuracy of 56 percent was obtained.

Accuracy of Cattle Price Forecasts

During the sixteen-year period cattle price forecasts made at Kansas State College averaged 62.7 percent accurate, ranging from a low of 37 percent accurate in 1931 to a high of 94 percent in 1929.

The seasonal variation in the accuracy of cattle price forecasts did not exhibit as great a degree of variance as did that of hog price forecasts. However, there was a general tendency for the forecasts to be more accurate during the late winter months and again during June, July, and August.

Using the average seasonal variation in the price of choice 700-1,100 pound steers at Kansas City 1922-38 as the basis for forecasting price, an average accuracy of 52.7 percent was obtained. During the months of April, August, and October the actual price changes most nearly corresponded to the change which would be expected from the average seasonal price movement. The actual forecasts made were 23.6 percent more accurate than those based only on the average seasonal price movement.

When the forecasts were rated in regard to their accuracy in predicting the general direction in which the price would move, it was found that they were accurate 68 percent of the time. When the trend during the previous thirty-day period was used as the basis for the forecast, an equal degree of accuracy was obtained. Thus it would appear that the general direction in which the price has been moving would be one of the most important factors to consider in formulating a price forecast for cattle.

Effect of Magnitude of Price Change upon Accuracy of Forecasts

The price forecasts made appeared to be most accurate during those periods in which there was little change in price and least accurate when the change was great. The hog price forecasts ranged in accuracy from 72 percent when there was no change in price during the thirty-day period to 59 percent when there was a great change in price. Cattle price forecasts ranged from 68 percent accurate during periods of no change to 57 percent during periods of great change.

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RATE OF COMMODITY DISAPPEARANCE AND CONSUMER PREFERENCE

BECAUSE of the augmented program of research in marketing, many agricultural economists in the United States are finding themselves involved in the fields of psychology and statistics to a greater extent than formerly. Although these two fields are far from being unrelated, the former deals more with logical classifications of mental concepts and resulting human behavior, while statistical methods are the tools and devices for measuring the intensities and interactions of these concepts and the probabilities of repetition of behavior.

Terminology in the field of consumer preference is confusing. As one travels around the United States he hears people express desires in such terms as *like*, *fond*, or *love*. It is entirely possible that the housewife who at her bridge club "just loves" the cake from a certain recipe "likes" it at home if she is sincere. This makes it difficult to measure people's opinions by their verbal expressions. At any rate, a survey of people's opinions as to how they "feel" about subjective matters may be entirely fruitless unless it is carefully planned both from the standpoint of statistics and psychology. A physician might probe a patient's abdomen and ask whether it hurts "much." If the patient has a subjective concept in which significantly less pain than exists in the mind of the physician means "much" he may pay for an unnecessary appendectomy, whereas if the reverse were true he may die for lack of necessary surgery. A better method would be to probe the general region of pain asking the patient to describe the degree of pain and plot directions of trends of increasing pain in order to localize the point of greatest pain. The points would thus be plotted in terms of the patient's own scale of subjectivity instead of the patient's compared with the physician's. Subjectivity can not be a constant even within one mind, but it will come closer there than if its interpretation must be conveyed to another mind. It should be borne in mind in consumer opinion surveys that the responses, unless manifested by measurable action, are entirely subjective and can be measured only in terms of this subjectivity. Measurement can best be carried out by finding out what a person's choice would be out of two or more alternatives and get the verbal expression of choice in the chooser's own relative and superlative terms.

There is a large gap of unrealism between a consumer opinion survey and what the consumer actually would do if the conditions assumed in the question actually existed as freedom for real choices. It is not uncommon to hear people say, "I would give my right arm for that." Although it is merely a figure of speech it means a very high price in their minds. A high price is stated because they are sure the commodity is not on the market. People are not willing to tax their mental energies beyond rather loose opinions and evaluations unless their energies are to bear fruit in reality. It is thus ordinarily more difficult to analyze and derive valid conclusions from statistics of opinion than statistics of behavior.

Those specializing in opinion surveys are making progress in correlating loose opinions and evaluations with real behavior despite indications of serious reversals. For many purposes, what people say they will do when a condition presents itself is the best index (adjusted by former correlations) of what they will actually do. However, the correlation between opinion and action can never be perfect, so, if the individual can be observed under experiments setting up actual conditions the results will be more reliable. Both consumer opinions and instances of behavior are imperfect manifestations of preference but it is probable that behavior is a better basis for predicting preferences. On this basis, consumer preference should not be determined from opinion if it can be determined from observed behavior at the same time and cost.

In experiments on consumers' preferences a procedure not entirely unknown to the vendor has been used. The plan has been to offer the consumers two or more choices and to shift the prices to affect the rates of purchases. When these prices have not moved goods at the relative rates desired by the merchant he has, as a result of previous experience, hunches, or trial and error, shifted the prices more. Having found his errors too great he puts on his "clearance sale." Those commodities that have in his estimation moved too slowly are reduced in price. Actually they then sell for less than they would have if they had been priced competitively with other commodities at a normal rather than an accelerated rate of disappearance.

The merchant may choose arbitrary rates at which he wishes different commodities or different grades or qualities to disappear from his shelves. In general, the limits of his arbitrariness are set only by his capacity to lose money. The researcher should not

choose arbitrary rates. He can not assume as the merchant ordinarily does that for his purposes there is an unlimited supply of the several choices. In some of the experimental work on consumer preference, an error has been made by arbitrarily assuming that the proper preference was at the price differential that would make the choices disappear at equal rates. There are preferences that should be based on equal rates, as for example the choice of pre-packaging one way or another or handling in bulk, but in cases where the supplies of the choices are interrelated this should not be the case—unless, of course, if they are interrelated in such manner that the supplies are equal.

There are those in the field of agricultural economics who look upon themselves as the "hired men of agriculture." How meritorious this attitude is depends primarily on whether these economists are concerned with efficiency problems or with problems of individual or group equities and whether they are privately or publicly employed. In marketing problems involving equities the public researcher or administrator needs to guard against becoming the pleader for or against segments of society. In order to take an unbiased or indifferent attitude toward group equities in marketing research, and if marketing researchers vested with a public interest are to enjoy the influence accredited to scientists this must be done, it will be necessary to have a clear-the-market concept in controlled experiments studying consumer preference. The rates of disappearance must then be guided by this concept. This is something that can not be fixed immediately and for the long run because the relative production of choices normally varies and will vary again when and if the results of research in consumer preference become influential on the market. The degree to which there will be variation will depend on the differences in the elasticity of the supply of the several choices. An equilibrium should be established by the price structure so that it will not be necessary to have "clearance sales" for any of the choices tested. Unless the clear-the-market concept is a guiding criterion there will be a tendency on the part of the researcher in marketing inadvertently to fall into the trap of scarcity economics. It would then become a problem of finding out what volume and type of supply would bring the greatest net returns to agriculture despite negative effects on the rest of the economy. Action of this type would soon make a syndicated political issue out of the marketing research program. The attitude must

be taken that agricultural economists in public institutions and agencies are hired men of the public.

Merely to have reached an equilibrium between consumer choices is not always carrying the research far enough for an accurate test. Take as a hypothetical example a comparison of selling apples in boxes or baskets. Conceivably all apples could be sold either way, so it would be logical to assume that when equal volumes are moving in each of boxes and baskets the price differential is then correct. Some studies that should have been carried further have stopped at this point. In this situation the price differential would be correct only while the two alternatives existed. It would not follow that *all* the apples could be moved equally well in either method. If half of the apples disappeared in boxes and half in baskets it might be true that each customer had reached a "zone of indifference" as to which he would buy. This, however, would be extremely unlikely. It would also be possible that the experiment had segregated from the others those consumers who want apples in boxes rather than baskets, or conversely, and price was not a factor. This also would be unlikely and the probable situation would be somewhere between these two extremes, The incidence of this probability needs to be tested.

When the equilibrium of rates of disappearance has been found through the pricing mechanism the next thing to do is to *withdraw one choice* at a time alternately and see what happens to the remaining rates. If, by chance, the total volume of trade remains the same regardless of which choice is withdrawn, then the "zone of indifference" represents the general indifference of the consuming population. If the volume of trade falls for either choice there has been segregation of consumers and it would not be safe to say that it makes no difference, in this example, whether apples are sold in boxes at a certain price or in baskets at a certain price. Whether a choice should be maintained depends on the effect on the sales volume not only of the choices in question but also on other "lines" offered to the same customers.

For many purposes of prediction it would be desirable to analyze facts concerning the consumers who indicated their preferences both in the equilibrium period and at the periods of alternately withdrawn choices. Analysis of them should serve as a guide in setting up questionnaires for interviewing consumers. In general it is better to predict preference from instances of behavior but these

may be related to facts pertaining to consumers. It is also more valuable to obtain information that is less changeable even though the information might deal in the realm of opinion. For example, it would be more important to get church affiliation than it would political affiliation or perhaps even than how the consumer actually voted. Factors of importance in stratifying the consumer population, so that a more reliable expansion might be made from the sample of consumers whose behavior has been observed, might be found through the process of alternately withdrawing choices.

In some studies the fact that people need time to orient or condition themselves to a new idea has been overlooked. Suppose an entirely new type of choice is to be offered to consumers. It might then be more important to measure an acceptance trend over enough time to prove that adoption of the choice would or would not be economical. In research this trend could be studied as a byproduct of the method of alternate withdrawal of choices.

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MARKET AND MARKETING RESEARCH IN THE MIDWEST

EACH state is doing work in these fields. Regional projects are set up in connection with livestock, milk, eggs, potatoes, fruits and vegetables, and poultry (technological). In some cases regional funds are used to expand work on local problems with little or no attempt to coordinate the efforts in a solution of a regional problem. There is need for a much more thorough and well thought out over-all program as to the basic problems in each field. It is recognized that effective research is done by competent individuals working often on rather small problems. But it is also desirable that these individual problems fit into a comprehensive plan.

Basic problems may be classified: (1) the market, (2) the organization of the marketing system in performing its functions effectively and efficiently; (3) the organization of individual firms in performing their particular jobs efficiently and effectively; and (4) the development and application of improved technology.

1. *The market*—This term is used to mean the quantitative and price aspects of an economy's sales of a particular good. We are concerned with the farm products and the products derived from

them in the 12 midwest states. Basically, we start in this area with grains, oilseeds, and forage crops as the major farming pattern with fruits, vegetables, tobacco, etc., as minor products for the region as a whole. In 1946 we converted these major products into animal products or sold directly as follows, in billions of dollars:

Meat animals	\$4.6	Feed crops (chiefly corn)	\$1.1
Dairy products	1.9	Food grain (chiefly wheat)	1.0
Poultry products	1.2	Oil-bearing crops	0.5

We need to know in detail all the factors which affect the market for these products and their principal subdivisions, e.g., cattle, fluid milk. By market we mean quantity and price considerations. The problem may be divided:

a. *General economic relationships*.—Price quantity relationships, income effects, distribution-of-income effects, general price level effect, competitive relationships, secular tendencies in relative demands, etc.

Much work has been done in this field, but much of it is now out of date. One can also criticize much of it as market research for undue attention to one phase of the problem viz, with price-supply relationships when the facts faced in the market are changes in the general price level, or with consumer incomes in the USA when the controlling factor may be a change in the international position.

b. *Market areas*.—To study the market one must know the size of the market area involved. This may be local or regional as for fluid milk; national as for beef; international as for wheat. An international market does not mean the whole world but only the areas in which the United States can actually sell. One must define the market area and its characteristics. For example, all our beef is sold within the United States but the market area for a particular class or grade of beef may be more localized.

c. *Market development*.—Consumer tastes change; new technology permits a product to be sold in a different form. These developments may be of minor importance to producers, as for example, a new pie crust mixture (which may be very important to the competitive position of a particular firm), or they may be very important. Important historical examples are refrigerator cars, vegetable shortening, and the rise in consumption of fluid milk. Economists should be alert to these developments and should be steadily evaluating them as they may affect situations in (a) and (b)

above. Thus the rise of vegetable shortenings apparently altered the demands for lard and refrigeration certainly changed the market areas for all perishable products.

The increased use of products in higher economic categories as consumer demands develop for them is in the interest of both producer and consumer. Some examples:

(1) Many consumers want better eggs than they can currently buy. Prevailing premium prices are evidence. The problem here is to develop marketing facilities which will act as the needed link between producer and consumer so as to satisfy adequately this market demand.

(2) Using dried skim milk as a food is a higher order of use than feeding it to livestock. Not only technology but effective merchandising efforts are necessary to develop this use.

(3) On a broader scale shifting milk from manufactured to human use moves milk up to a higher category of use. Much of the reorganization in the country end of the dairy industry over a long period of years has been in response to this fundamental shift in market outlet.

Many other illustrations might be given. The basic point is that market research should aim at searching out any undeveloped market outlets which will shift products to a higher category of use. To effectuate the changes, much marketing research may be needed.

When the use of a product increases (other than in response to population growth) adverse effects are likely for competing products. So market research must also be alert to developments tending to push certain commodities down the scale of use.

2. *The organization of a marketing system.*—Between the producer and consumer is a complicated marketing system. For simplicity we include in this system all agencies in the area whether they perform merchandising, transportation, processing, or other functions. For different groups of commodities the details of the system vary although in each case it performs broadly similar functions. However, for convenience in research the various commodity systems can best be studied individually but always in the light of the general principles common to all.

“What functions must a market system perform?” and “How effectively and efficiently does it perform them?” are key questions.

Some important functions will be briefly mentioned. Filling in the details of a particular system and measuring its efficiency are problems for specialized research.

a. *Pricing functions.*—The most important function of any marketing system is pricing at every level of the system where title to goods is transferred. It is by response to prices that consumers register their opinions as to their relative demands for different kinds of goods. It is by prices that the basic market factors—supply and demand—are balanced. Evaluating the system of pricing should be the first object of systematic marketing research. Certain criteria of efficiency need to be set up and each system studied to see how well these criteria are met.¹

After such an examination, one is in position to make suggestions for changes. Much research in milk marketing has centered on this problem. Formulas to guide public agencies in setting milk prices have been evolved. Some of them have broken down because the functions which prices must perform in a market were not clearly understood or the formulas did not allow for factors which would cause prices to vary so as to perform their functions.

The failure to provide a supply of the quality needed to satisfy a high level of demand may indicate a pricing system which does not reflect this demand back to producers. The University of Illinois research in egg marketing was set up to study this question.

A part of a pricing system is a system of market standards. Without such standards prices have no specific meaning. In analyzing the pricing system one should examine how well the standards in use really reflect the differences which users, either intermediate or final, really desire.

These illustrations point up the fact that evaluation of the marketing system should begin with the pricing functions.

b. *Risk functions.*—Investments in facilities or commodities create risks at every level of marketing. Risks are costs which must be covered if the people are to do certain jobs. Marketing systems develop ways of providing for these risks. It may simply be a wide margin or mark-up which will cover the risk involved. Fruit and vegetable markets illustrate this method. It may be the evolution of very large firms with large capital resources and stable retail price policies, as in tobacco. It may be the development of special market institutions for hedging as in the grain, cotton, egg, and butter markets. In any analysis of the marketing system these

¹ For a tentative list of such criteria see L. J. Norton, *The Effectiveness of Market Mechanism for Adjusting Farming to Public Need*, Proceedings of the Sixth International Conference of Agricultural Economists, pp. 113–115, Oxford University Press, 1948.

particular devices need to be studied and evaluated. The existence of risk is a primary cause for the entrance of governments into the marketing field. The various systems of supporting minimum prices that have been evolved should be included in any comprehensive study of risk.

c. *Physical functions*.—In moving goods from producers to consumers many physical jobs are needed: assembling, transporting, processing, storing, distributing, display, etc. Marketing research in agricultural products has perhaps dealt too much with these rather than with the more fundamental pricing and risk functions. The logical order of analysis is (1) to determine the jobs to be done and (2) to study the system to find out the kind of firms developed to do them. A careful analysis may find that some link in the process is unnecessary or that some other type of agency can do it more effectively. The actual patterns are constantly changing. The researcher should discover these changes. He should evolve a standard which will permit him to evaluate them and when adequately qualified, even to suggest changes. Cases in point over the last 30 years are:

(1) The development of larger units in food retailing with all kinds of foods in one store often associated with the combining of retail and wholesale functions.

(2) The shift to paper containers in milk distribution with accompanying increased sales of milk in retail stores.

(3) The decentralization of the livestock market particularly for hogs.

Other students may wish to analyze the marketing system in terms of more than these three major functions. However, our general division into pricing, risk carrying, and physical functions will be found useful.

3. *The organization of individual firms*.—The marketing system is made up of a very large number of individual firms, some large and some small. For any analysis of detailed operating problems, the firm is the basic unit of study. However, in a logical program of research a systematic knowledge of the market and the marketing system should precede studies involving individual firms. In getting answers about the market or the system we must often, of course, use data from firms.

Work with individual firms may be of the following kinds:

a. Development of basic data as standards to measure efficiency in performing different functions.

b. Analysis of specific practices in particular firms, especially those which are introducing new methods.

Since the big costs of marketing are in retailing, work in this field should emphasize studies in that area.

4. *Technological research.*—Many marketing problems can only be solved by technological research. Some of this may reach back into the area of production. Examples are: Retail store sales of milk are based on the paper container. Marketing ripper peaches apparently depends on a solution of the "brown rot" problem. Marketing better sweet corn depends on development of practical and economical methods to precool it at or close to the farms. Strengthening the competitive position of lard in comparison with the shortenings rests on development and promotion of more stable lards. The economist can point out problems based on market research and should be aware of technological changes and be in position to evaluate their effect marketwise.

Technological research by public agencies ought to be directed toward problems of general application rather than at specific problems of particular firms. A highly specialized product may be very important to the competitive position of a particular firm but such research on it can best be done in the firm's own laboratories. The paper milk bottle and the problem of stabilizing lard are examples of generalized technological research.

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SUMMARY OF PRACTICES AND PROCEDURE IN TEACHING MARKETING OF FARM PRODUCTS

IN assembling material which might be helpful in discussing the problem "Methods of Teaching in Agricultural Economics" to be used at one of the roundtable programs at Green Lake in the autumn of 1948, a questionnaire covering certain phases of teaching methods and practices was prepared and sent to all the land grant college departments of agricultural economics or marketing. Forty states returned reports. Their replies may be briefly summarized as follows:

A. General

Credits or hours in introductory marketing course

2 credits	.	2 states
3 credits	29 states

4 credits	3 states
5 credits	5 states
States giving graduate credit for this course as well as undergraduate	19 states
Prerequisites required	
Introductory course in economics	24 states
Junior standing	2 states
Sophomore standing	3 states
<i>B. Presentation of Subject Matter</i>	
Lectures over 80% of class time	9 states
Lectures not over 50% of class time	12 states
Average percentage of time used for discussion	$\frac{1}{2}$
Laboratory work utilized	13 states
Use of field trips	8 states
Formal student reports required	19 states
Use of mimeograph materials	32 states
Use of film strips	10 states
Use of textbook for course	38 states
<i>C. Size of Section Preferred</i>	
Sections not over 25 students	11 states
Sections 25 to 30 students	9 states
Sections larger than 30 students	5 states
<i>D. Division of Subject Matter</i>	
Over 50% of time devoted to descriptive matter	24 states
Over 50% of time devoted to functional aspects	16 states
<i>E. Examinations</i>	
Discussion questions exclusively	4 states
Objective tests 50% or more of total	20 states

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SAMPLING MEDICAL SERVICE CHARGES: A NEW APPLICATION OF SAMPLING METHOD

THE use of the "parity price" measure in the administration of government programs relating to farms and farmers places a heavy responsibility upon the agency which constructs the index numbers of prices farmers pay for the commodities they buy.

Since 1911, when the U. S. Department of Agriculture started to gather data on prices paid by farm families, there has been a continuous effort to develop such data and to use appropriate statistical procedures for obtaining and analyzing them and in constructing the index of prices paid.

Within the Department of Agriculture, the responsibility for gathering and summarizing the data that are used for computing the index of prices paid by farmers has been placed upon the Bureau of Agricultural Economics. The number of items on which price data are available has been expanded from time to time and at present most of the principal categories of farm family expenditures for commodities are represented in the index of prices paid. However, there are several types of services bought by farmers that are not in the index, and for which adequate data are not yet available. Medical service is one of the more noteworthy of these groups.

Expenditures for medical care are an important element in the farm family budget and this has long been recognized. A survey covering 1941, made by the Bureau of Human Nutrition and Home Economics of the U. S. Department of Agriculture, indicated that the families of farm operators spend annually about \$370,000,000 for medical care, medicines, and drugs. This was nearly \$60 per farm family, or 7 per cent of the average farm family budget.

In 1936, data on the fees charged for office calls and associated medical services were obtained by agents of the Bureau of Agricultural Economics in 19 states, covering the periods 1910-14, 1924-29, 1932, and 1935-36. Since then, the Department has not had the funds nor the personnel for collecting similar data on an annual basis. After the end of World War II, the Department has again investigated the problem of getting the information needed in the construction of annual index numbers of prices paid by farm families for medical services.

Measuring medical expenditures by farm families presents a number of difficulties. Many of these difficulties are inherent in

the nature of the expenditure patterns themselves. Heavy expenditures are often unplanned and arise from an accident or emergency operation. Broadly speaking, there are two general approaches to the subject. The first concerns surveying the farm families directly; the second would deal with doctors, dentists, hospitals, etc. that serve farm families. The technical design of sample surveys for either of these two broad groups is very difficult to work out. However, largely because of the variation in type and amount of medical care among farm families, it is believed that this question can best be approached through inquiries to hospitals and the medical profession. A survey plan was devised for Maryland and tests were made in that state to test the adequacy of the sampling procedures used and the workability of the schedules and methods.

The sample in the Maryland survey was designed for obtaining information by interviewing physicians, surgeons, dentists, hospital officials, oculists, and optometrists that would yield data from which state estimates could be made of the rates paid by farm families for selected types of general medical service. If such a survey were extended to a sufficient number of other states, data would become available for computing indexes of the percentage changes in the prices paid by farm families for all medical care.

In conducting the sample survey in Maryland, questionnaires were prepared for each selected type of medical service. Physicians and surgeons were asked to report the most common fees charged families for the ordinary types of services rendered. The questionnaire for dentists asked for charges to farm families for filling, cleaning, X-raying, and extracting of teeth. Hospitals, serving farm families, were asked to report on the cost of hospital rooms, salaries of registered and practical nurses, as well as charges for other common hospital services. Oculists and optometrists were asked the fees most commonly paid by farm families for eye glasses.

A separate sample was designed and used for each of the four types of questionnaires, (1) Physicians and surgeons, (2) Hospitals and nurses, (3) Dentists, (4) Oculists and optometrists. The basic pattern of the sample for each of the four surveys, however, was determined by the sample used for the Physicians and Surgeons Inquiry which therefore is discussed first and in more detail.

The 1942 Directory of Physicians and Surgeons of the American

Medical Association was used as a basis for selecting doctors to be included in making the survey. The first step was to eliminate, by using the medical directory, all doctors who limited their practice to special fields or excluded farm families in their practice, and also to eliminate physicians and surgeons practicing in the large industrial cities where the Bureau of Labor Statistics gathers similar information on medical services. The intention was to include in the universe of inquiry only those doctors who provided farm families with general medical care. Thus, from the medical directory a list of about 650 physicians and surgeons was obtained which satisfied this criterion of providing general medical care to farm families in Maryland.

This list of 650 doctors was arranged alphabetically by towns and by counties for each agricultural price reporting district in Maryland. Next the list was divided into two sections. The first section consisted of doctors in towns which had two or more physicians or surgeons, and the second section of the list consisted of doctors who were in towns which had only one physician or surgeon. It seemed necessary to make this separation because a slightly different sampling ratio was needed for each situation in order to represent adequately the state as a whole. The goal was to obtain about an 8 percent sample of doctors serving farm families and at least 50 reports as the minimum number needed for reliable state estimates. Actually a somewhat greater number of doctors' names was selected in order to compensate for the inability of interviewers to reach some doctors and to allow for refusals to answer. The sample ratio was computed by dividing 60 (the number of names desired) by the total list of 650 doctors previously selected. On this basis every eleventh physician or surgeon on the list was to be selected for interview. This sampling ratio was applied directly to the sub-list of doctors practicing in towns having only one physician or surgeon. The fifth name was selected and every eleventh name thereafter was chosen to be interviewed in the doctor survey.

In selecting doctors to be interviewed from the sub-list of those practicing in towns which had more than one doctor serving the farm public, it was necessary to modify this procedure somewhat in order to minimize travel and to assure that average fees obtained would represent the particular towns randomly chosen by the sample. A restriction was imposed that at least two doctors in each town selected should be included in the sample. The procedure

was to choose the eleventh name on the list and the one below it as a starting place. Thereafter every twenty-second name was chosen along with the next following name. Rules were adopted which assured that two doctors having separate practices would be selected in each town surveyed. The addresses of the doctors selected for interview automatically determined the towns which formed the basic sample for the surveys on other medical charges.

The sample for the hospital, dentist, oculist, and optometrist surveys was determined by the towns selected in the doctor's sample. Where a choice was to be made within the pre-selected town, the names of dentists, oculists, and optometrists were selected at random from the classified section of the telephone book. Data were also obtained from all general hospitals in the towns covered by the doctor's survey. The size of the sample in each town was made equal to the number interviewed in the doctor's survey. The interviews were conducted by a statistician from the Maryland State Office of the Agricultural Estimating Service at College Park and a statistician from the Bureau of Agricultural Economics working together.

Survey results indicate that in Maryland the rates charged farm families for medical service have not advanced so rapidly during recent years as have prices paid for most other items used by farm families for living purposes. The preliminary results in Maryland gave a 1947 index number of 164 percent of the 1910-14 base period, previously mentioned.

This survey did not attempt to measure the extent to which such services are used by farm families, but recent investigations by the Bureau of Human Nutrition and Home Economics indicate that farm families are having increased medical care. Moreover, doctors interviewed in this survey in Maryland said that farm families at that time had more money to spend on medical care than they did a few years ago, and that collections from farm families on bills had recently been above average.

Analysis of the results of the survey indicates that this sampling procedure may be expected to produce satisfactory data from which state estimates of the prices paid for individual services may be made, for use in the construction of an annual index number representing medical services.

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BOOK REVIEWS

Joint Committee Report on Extension Programs, Policies and Goals,
U. S. Government Printing Office, Washington, D. C. August
1948. Pp. 72.

This is a report of a Joint Committee of ten, five appointed by the U. S. Department of Agriculture and five by the Association of Land-Grant Colleges and Universities in October 1946, with the following general objectives: (1) Appraise the services and experiences of the Cooperative Extension Service over the years; (2) study the important basic problems of cooperative extension work, particularly relationships with the U. S. Department of Agriculture and Land-Grant Colleges; and (3) develop definite recommendations as to how the Cooperative Extension Service can best meet the problems of the future.

The accomplishments of extension work during the one-third of a century of its operation are summarized in the first section of the ten-section report. The primary function of extension work in agriculture and home economics is education, and the report emphasizes this point. The proper performance of this function requires use of an increasing number of techniques in an ever widening range of subject matter. This entire section is a very modest but sound statement of the achievements of extension work. The section concludes with this significant statement: "In short, whereas extension has done much for people, it is what extension has helped people do for themselves that achieves the greatest results."

There is danger that this broader function—helping people learn to help themselves—learning how to solve their own problems—may be overlooked too frequently. The specific improved operating practices which can be appraised in terms of immediate and tangible results on the farm crowd out this broader objective. Moreover, there is a growing obligation to help farm people understand the complex social and economic problems—local, national, and international—that face them. It is in this field of work that so many agents, particularly the older agents, have the most difficulty. Many have difficulty developing and maintaining a well-balanced and complete service in their counties. A much more comprehensive program is needed today than was provided in the early years of extension work.

The Committee makes five specific recommendations regarding the relationships between the United States Department of Agriculture and the land-grant colleges and universities in connection with extension work: (1) To keep mutually informed on new developments quarterly meetings should be held between representatives of the Department and the Association of Land-Grant Colleges and Universities; (2) annual meetings should be held between the Secretary of Agriculture and an appropriate committee of the Association; (3) the Department and the colleges should reach agreements on responsibilities *before* new Department programs are launched which involve education in the States, (4) Department agreements with other State agencies involving education should be worked out in conjunction with the colleges; and (5) the Department and the colleges should give greater assistance in training State extension workers.

The Committee feels that despite some difficulties experienced in recent years in operating under the "Memorandum of Understanding" of 1914, the Memorandum is nevertheless an adequate statement regarding cooperative relationships between the Department and the State colleges in conducting cooperative extension work. If adhered to, all educational programs within the State for which the Department has a responsibility will be carried on through, or in cooperation with, the State colleges.

The perennial problem of the proper relationships of the Extension Service with general farm organizations is discussed in Section Four. The Committee concludes that, although close cooperation with general farm organizations is highly desirable, former operating relationships with such organizations are detrimental to the public interest. It specifically recommends that all legal connections and exclusive operating arrangements between farm bureaus and the Extension Service be discontinued, and that Extension Service officials and farm bureau leaders in the States concerned take the initiative in this matter. A dissenting opinion by one member of the Committee is also included in the report covering this point.

The Committee recommends full coordination of the three college functions—resident teaching, research, and extension. It believes responsibility for such coordination should be placed under one administrative head, and that each subject-matter program of the three should be combined into one department. This reviewer believes this is a sound recommendation, but realizes such coordina-

tion is far from achieved in many land-grant colleges for one reason or another.

The Committee believes that while subject-matter specialists are of great value to extension work, the specialized approach can, and frequently is, over-emphasized. In appraising the trends and outlook for extension, the Committee lists the following as the effects of technological progress: (1) A need for more knowledge of the use and maintenance of machinery; (2) an increase in the capital required for efficient farming and rural living; (3) a widening of the gap between efficient and inefficient farmers, and the resulting displacement of farm labor; (4) increased production, and hence need for greater emphasis on soil conservation and on marketing distribution; and (5) continuous changes in the home, with new opportunities and new problems for the homemaker. Other trends of particular importance to extension in the future are: (1) The need for rapid expansion in the field of conservation of natural resources; (2) the need for expanding emphasis on individual farm and home planning; and (3) the decreasing number of farm families and the increasing number of rural nonfarm families; and (4) the continued need for, and emphasis on, better rural health and rural educational services.

The Committee concludes that the present need for extension education among farm people is apparently far ahead of the capacity of extension to meet it, and that this should be a great stimulus to extension efforts. It calls for a careful sifting of demands and effective allocation of time and effort. Particularly great is the need for the extension type of informal, continuing educational programs. Extension's goal should be to maximize efforts on education, and guard against any tendency to become largely an emergency or administrative agency.

This Joint Committee report is an excellent statement of extension programs, policies, and goals. It should be read by every staff member of our land-grant colleges and universities. If the recommendations contained in the report are carried out effectively, extension can certainly expect a growing need for its services in the years ahead, and be confident that the Nation will profit greatly from its services.

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Rural Mexico, Nathan L. Whetten. Chicago. University of Chicago Press, 1948, Pp. xix, 671, XXIII Plates, Statistical Appendix, and Index. \$10.00. Foreword by Manuel Gamio.

Rural Mexico is a scholarly work devoted to the understanding of the land of the author's birth. Professor Whetten, now of the University of Connecticut, spent his childhood in Mexico. This investigation was made possible by his appointment for three years as a member of our Embassy staff in Mexico City. One gets the impression that Professor Whetten has written with two sets of readers in mind, the Mexicans and ourselves. The result is an extremely well balanced book which ranks with the previous landmarks of analysis and interpretation of Mexico by our scholars: as, Simpson's *Ejido*, Tannenbaum's *Mexican Agrarian Revolution* and McBride's *Land Systems of Mexico*.

The study is divided into four major parts: population and geography, the relation of the people to the land, standards and levels of living and social institutions. A vast amount of information is included in the 91 tables in the text and the appendix of 41 tables. Professor Whetten has included a digest of the major published statistics on rural Mexico plus numerous presentations from hitherto unpublished data. The 20 page bibliography provides an excellent guide to the literature in both Spanish and English. Especially in his treatment of land tenure, the author uses a comprehensive review of previous studies to state the problem for his own work. The statistics on the results of the land reform program include the data for 1945. Throughout the study, one finds the insight that can come only to one who has travelled to the remote valleys and visited with countless people in their own tongues.

Rural Mexico is not only a competent study; it is an important one. It has great significance just because Mexico is beset with so many of the difficulties and problems that plague the world today. This era is undoubtedly the most revolutionary one of recorded history. No one can foresee the end but the Mexican Revolution of 1910 may well be considered marking the beginning of this series of social upheavals. Mexico is a vast laboratory of this violent age; a few of the more significant facts may be noted.

The Mexican Revolution antedated both the Russian Revolution and World War I; it was not a planned revolution at all, as Whetten points out so clearly. But once the people were aroused by the prospect of "Land and Liberty"—the old order was doomed.

The most dramatic and fundamental part of this revolution has been the confiscation of large estates and the re-distribution of land. This is only the beginning of social reconstruction; but the "fat is in the fire" as we say. One can argue the pros and cons of the Mexican land revolution, and Whetten presents the evidence and arguments with impartiality, but most of the arguments about whether or not the revolution improved conditions are simply comments after the fact. Efficiency of resource use is not a major question during a revolution, partly because property and security of expectations are demolished thereby, and partly because deeper issues are at stake, such as equitable distribution and human dignity and freedom. A comprehension of the Mexican Revolution is a valuable object lesson to all of us interested in rural and human welfare, not because revolutions are something to be desired, but because revolutions break out when no other methods of meeting human needs and aspirations have been devised.

Twenty-three percent of all the crop land in Mexico has been re-distributed by the land reform program. Allotments have been given to 1.7 million persons out of a total population of 20 millions. Although we have heard much more about the grants to communities, the ejidos, the land reform program also resulted in a great increase in small individual holdings. Among the 1.2 million private holdings in 1940 about three-fourths were of less than 5 hectares (about 12.5 acres). Fifty-seven percent of the land holdings were on the ejidos. It is interesting to note that the land reform program was conceived initially as a way of giving workers a small plot of land upon which to live that they might earn most of their living from employment near-by. But the torrent once loosed cut through the very structure of land ownership, tearing great haciendas to pieces. Most of the ejidos are operated in tiny pieces with the individuals holding the rights to use specific pieces of land. Those fragments are not farmed well; for the most part these people have few tools and only the most primitive knowledge of farming. But the eighth of the ejidos farmed collectively have their troubles too, since the farming operations must be done by joint action. Students of farm management will find this part of Whetten's analysis especially interesting. If one compares these operations with those on the Russian collectives, he will be impressed by the strenuous efforts at democratic procedures in Mexico, even though an elected foreman makes a very poor boss.

Social reconstruction is complicated in Mexico, and in many of the other Latin-American countries by the "Indian question." The 1940 census of Mexico was taken in 50 tongues. Spanish and 49 Indian dialects. Our own country was "settled" by Europeans; Latin America was "conquered." The result was a feudal structure in which the Indians were slow to learn the language of their conquerors, furthermore the ideals of private property and individualism which sparked the liberation of European serfs had little relevance to the social life of the indigenous population. These are some of the consequences of conquest which remain in Latin America today. This conflict of cultures makes the problems and prospects of rural development in the Latin Americas more difficult, in many ways, than in the Middle East and Far East. In these latter areas poor peasants share the same culture with the more fortunate people.

It is hard for us to comprehend the poverty which still exists in Mexico. Two-thirds of the people are farmers of some sort. Forty-five percent of the people were classified as living in huts by the last census. Many of the so-called houses were little better, without chimneys or any other conveniences. Forty percent of the people have no beds, either sleeping on the dirt floors or on little platforms. Few people have access to good drinking water. About one in four have no shoes. Once this is realized it is easier to comprehend that an Indian is someone who lives like an Indian; i.e. in abject poverty. One can cease to be an Indian by putting on shoes and assuming some of the other characteristics of the upper classes.

One is tempted to say that all the dilemmas of economic progress in backward economies are found in Mexico. Where an agrarian revolution occurs, the peasants getting a small piece of land are most likely to grow something to eat. They eat better even though total agricultural production decreases. In a country like Japan this creates a food crisis in cities. In a country like Hungary this creates a crisis in international trade, as wheat for export is not forthcoming. In Mexico, a self-sufficient peasantry grows corn everywhere; this is the mainstay of their diet and the core of their natural economy of subsistence. Whetten's analysis of diets is illuminating and gives a commendable orientation for land utilization studies in backward economies. In the background of this study lurk all the thorny questions of economic development. How can food production keep pace of the increase in population? How can

a country become industrialized, so that the standard of living can rise? How can the needed capital be secured, where there is so little margin for savings?

The answers to those tremendous questions are not clear in Mexico. Furthermore, the projection of such questions upon a world plane make the answers still more difficult. Surely the solution all over the world cannot be to industrialize and purchase the needed food. It is the recognition of this fact which is making Neo-Malthusians out of so many people these days.

But if the answers aren't clear in Mexico, at least the way is now open for thoughtful consideration of the ways out. The ground has been cleared. The fate and hopes of the country seem to hinge on the possibility that the revolution may eventually energize the people in a way that a feudal society never could. In Whetten's concluding words: "The personal freedom enjoyed by the general population is probably the greatest achievement of the Mexican Revolution. In the long run, this may prove important enough to counterbalance whatever mistakes may have been made."

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Plowshares Into Swords, Arthur P. Chew, New York: Harper and Brothers, 1948. pp. xv, 221. \$3.00.

The thesis presented in this book is that wars are caused by an unbalance between agriculture and industry. Industrial nations (except the United States) have access to food only by exchanging industrial products with agricultural exporting countries. But agricultural countries are industrializing themselves. In the process, tariffs and trade barriers are raised against the industrial countries. As a result, industrial countries are forced into imperialism in efforts to annex agricultural areas and re-establish the balance between agriculture and industry within their own borders. They beat plowshares into swords because "they have an overwhelming need for plows or more literally, for agriculture; it is for agricultural resources that they go to war."

This argument is developed in its various aspects in the first eleven chapters. A number of topics are discussed. Agricultural self-sufficiency is fostered in industrial countries as their export trade declines. The relation of population growth and world conflict is discussed. Here the author emphasizes the rapid growth in Euro-

pean population and the resulting top-heavy industrial structure. He quotes the early Veblen on war with approval and disagrees with Veblen's later views that the masses of the people have no interest or gains from imperialism. In his discussion of declining populations he suggests that reductions in the working population will complicate the problem of food procurement by lowering the production of those industrial goods that can be traded for food. No tables and few statistics are given.

In later chapters he discusses the position of the United States with high industrial tariffs and subsequent efforts of American farmers to develop a price system providing comparable benefits to agriculture. He deals with the separation of industrial Europe from agricultural America. In chapter XVI the author discusses export dumping, appearing to accept the idea as a necessary means of keeping the economic wheels turning. He does not discuss the possible repercussions in other nations. He deals with conservation and immigration as possible partial solutions of the agricultural-industrial imbalance. Finally he proposes two immediate alternatives and one long time solution to the problem.

The first solution is a system of much freer trading which he rejects as being politically impossible. The second alternative is world effort to provide forbearance in industrialization by agricultural countries and to provide security of food imports to the industrial countries. While the exact implementation is not specified, it might take the form of a series of industrial commodity agreements whereby industrial countries are provided guaranteed sales of their output. It is difficult to see much real difference between the two programs. The long run solution is an urban-rural balance within national boundaries all over the world, attained by industrializing agricultural countries and developing agriculture in industrial countries or by coalescing nations together.

Much of the discussion in the book is a somewhat different version of the have and have-not nation theories prevalent before World War II, couched in agricultural rather than raw material terms. This reviewer sees little justification for changing the terms of the argument. Coal, iron ore or oil may be considered far more vital than food in some nations.

Another phase of the argument that seems weak is that there is a limited demand for industrial products. He argues that as an agricultural nation builds textile mills, steel mills, machinery plants,

etc., its purchases of industrial products inevitably decline. There is no recognition of the possibility of increasing the sales for other types of industrial goods and advancing the level of living to satisfy an entirely new order of human wants. Of course, two world wars and a major depression have not furnished a favorable economic climate for developing real experience along these lines.

The problem of economic relations and world peace obviously is important. The role of the United States in leading the way in adjusting the conditions and terms of trade is clearly shown both in regard to trade barriers and price support policies. Mr. Chew proposes the difficult road of controlling the development of new competitive industrialization, and eventual uniform balance between agriculture and industry within each country. This would eliminate a large part of the gains from specialization and trade. This reviewer believes that there is more to be gained and still some hope of success in revising our actual trade policies to conform with our theoretical trade policies.

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A Survey of Contemporary Economics edited by Howard S. Ellis. Philadelphia: The Blakiston Company, 1948. Pp. 472. \$4.75.

A Survey of Contemporary Economics is an attempt on the part of "specialists" to review and appraise the developments which have taken place in their respective fields, during the past "ten or fifteen years." The impetus for the compilation and publication of these reviews was supplied by the American Economic Association's committee on the development of economic thinking and information. The recent developments in each of the foremost areas of specialization within the field of economics have been summarized by a competent authority and his appraisal in turn has benefited from the criticisms of two qualified and able critics. In the words of the editor the purpose of the volume "... is to provide the economist outside a particular field an intelligible and reliable account of its main ideas—both analytical devices and their practical application to public policy—which have evolved during the last ten or fifteen years."

In Chapter 1 Bernard Haley summarizes the developments which have taken place in the area of value and distribution. Much of this section is concerned with the impact of the indifference curve

approach on the theory of demand and with reporting a number of empirical studies bearing on the supply side. Haley's comments are more in the nature of summarization than of interpretation and appraisal.

Much of the discussion in Chapter 2 on employment and business cycle theory and in later chapters on monetary theory constitutes an attempt to fit the torrent of ideas and controversies unleashed by Keynes into the evolution of economic thought. Indeed, the doctrines of Keynes intrude at some point into nearly all of the resumes which are presented in the volume. Viewed in the aggregate these discussions seem to the writer to indicate that much mastication and perhaps regurgitation of the Keynesian concepts and their implications lie ahead before they can be regarded as thoroughly and finally digested.

In a lucid discussion of monopoly and the concentration of economic power, J. K. Galbraith traces the impact of the work of Joan Robinson and Edward H. Chamberlain on economic analysis. He concludes that the most important contribution of these two noteworthy books was "to emancipate the analysis of markets from the inadequate categories of competition and single firm monopoly." But in appraising the results of 15 years of renewed effort to unravel the problems surrounding monopolistic enterprises and to evolve a public policy adequate to cope with them, Galbraith concludes, "It is apparent that although the increment of knowledge has been considerable, both tasks have been attended by considerable frustration. The analytical task would appear to have failed because oligopoly by all evidence the ruling market form in the modern economy has not yielded to the kit of tools long employed for the analysis of the competitive market. . . . It is the essence of the oligopoly solution that any individual can effect the solution. The analysis therefore had to take on a wholly unmanageable burden of assumptions as to how each participant in the market would behave."

Wassily Leontief's review of the work of the econometricians should be welcomed by the non-mathematician who has found himself puzzled by their manipulations. Leontief explains that the function of statistical analysis in application to econometric research is "that of an intermediary between a general theoretical hypothesis and the directly observable facts." He suggests that the outstanding developments of the last years lie primarily in the realm of methodology rather than in the direction of factual analysis, and then adds

"certain signs seem to indicate that this phase is now drawing to its close and that the years immediately ahead will witness new accomplishments in fields of applied studies."

The book ends with a peppery and thought provoking summary by David McCord Wright on the prospects for capitalism. If after dwelling through much of the book upon the seemingly overwhelming problems confronting our "capitalistic" system one is led to despair of its future, Wright does a masterful job of dispelling the gloom. He states that he cannot see that capitalism is suffering from any basic functional weaknesses in the sense of immutable laws preventing it from working. While he agrees that capitalism's future depends upon intelligent policy, Wright concludes, "It is difficult to escape the conclusion that under the present conditions capitalism, economically speaking, once more makes sense. In the light of world conditions what we need now is saving and production, and what can do a better job in these respects than capitalism?"

The science of economics, like the intricate economy whose functioning it seeks to analyze, has sought a "gain in product from the division of labor." But if it is to be fruitful exchange must accompany specialization. One can reasonably doubt that there has been a sufficient exchange of ideas among those working in the highly specialized areas within economics. Because they are without exception remarkably intelligible, considering the complex analyses they treat, these surveys are particularly well fitted to facilitate such an exchange of thought. *A Survey of Contemporary Economics* should be especially useful to the agricultural economist interested in catching up on what those working in other branches of economics have to offer.

RAYMOND R. BENEKE

Iowa State College

Conservation in the United States, A. F. Gustafson, G. H. Guise, W. J. Hamilton, Jr. and H. Ries (Cornell University). Comstock Publishing Co., Ithaca, N. Y., 3d edition, 1949.

Conservation in the United States is the third edition of a textbook that was first published ten years ago. It describes the extent and use of our natural resources, and as the title implies, gives particular attention to future supply-demand relationships. The book is interestingly written, well-organized with a good index, and enlivened by more than 250 maps, charts, and illustrations. Many of the pho-

tographs were taken by the authors and contribute to the impression that this book is a personal account of the conclusions reached after many years of study and observation.

Following a brief introduction and a chapter devoted to the development of conservation movements in this country, the book is divided into four sections written, apparently, by the four authors in the order in which they are listed on the title page. The first section deals with soil and water resources; the second with forests, parks, and grazing lands; the third with fish and wildlife; and the last with mineral resources. The chapters pertaining to soil resources describe the geologic origin of soils, the distribution of soil types in the United States and the related types of farming, the nature and extent of soil depletion and erosion, and the various methods and programs for soil conservation. In a general way, this treatment of soil resources characterizes the discussion of the other resources as well. In each case, the authors present an inventory of the resource, the uses for which it is valuable, the extent of its depletion, and the possibilities for its conservation. The result is a book adapted for general use in college-level courses in land economics or resource conservation.

The principal shortcomings of this book are those of omission. In its 512 pages—approximately 100 pages more than in the first edition—the authors discuss a great variety of subjects, frequently in some detail. As a consequence, certain topics are not treated as fully as some readers may expect. The 21 pages devoted to western range resources, for instance, contrast with the 41 pages describing fish and fisheries, and the 52 pages relating to game, fur, and other wildlife resources. Little or no attention has been given to such land-use programs as the submarginal land purchase and resettlement programs, rural zoning, land-use planning, and the AAA incentive programs for soil improvement. There is no discussion of land as space, or of the land requirements for transportation and urban uses.

The authors are primarily interested in the physical aspects of resource utilization, but it would seem that a discussion of conservation requires more than passing reference to property rights. Arid-region water resources, for instance, are adequately represented as a scarce and valuable resource, but little attention is given to the elaborate legal doctrines by which those resources are allocated, used, and conserved. Comprehensive treatment of conservation

also seems to demand some mention of our most important resource—people—and the resource problems resulting from population growth and distribution.

By treating the various natural resources successively and independently, the authors have avoided—and failed to answer—some of the most troublesome questions of conservation. By one definition at least, conservation is a rationing process involving a choice between dissimilar alternatives. Within limits it is not possible to save one resource without increasing the burden on others. This book competently demonstrates that we should preserve our soil, water, trees, and minerals, but it does not indicate how we are to warm our homes without using coal, fuel wood, natural gas, petroleum, or some other natural resource. In discussing the destruction of agricultural land in strip-mined areas, the authors come close to disagreement because they are considering soil resources in one context and minerals in another (p. 168 f., and p. 434). The fact that “best land use” implies alternative possibilities which must somehow be weighed and compared by a common standard of evaluation is inadequately acknowledged.

An economist will note that this entire book on conservation makes only casual reference to the economics of resource utilization. In discussing forestry, for instance, there is no mention of the time required to produce a timber crop, or the compounding of interest, taxes, and other costs with which a forest owner must reckon, or the various reforms in forest taxation which have attempted to make timber growing economically feasible. The possibility of conserving forests—or any other resource—will often depend on such economic considerations, or upon the fact of public ownership, public expenditure, or police power regulation. These elements are no less important than physical and technological factors in determining the use and conservation of our natural resources.

C. W. LOOMER

University of Wisconsin

Forest Farming and Rural Employment, Charles H. Stoddard, Washington, Charles Lathrop Pack Forestry Foundation, 1949, Pp. 29.

Forest farming has been suggested at various times as a means of (1) increasing total timber production, (2) securing better forest

management on private lands, and (3) providing employment for rural people. This study presents an excellent analysis of the opportunities for and the limitations of forest farming.

The forest farm is defined as "a unit of land and timber with a combination of tillable land, forest growing stock, and capital equipment sufficient to sustain full-time employment with forestry as the major activity, for one family, with a minimum of two men of working age. A full-time forest farm would provide two men 250 days of forest work a year with subsistence farming incidental thereto."

It is estimated that a full-time family-type forest farm would require an annual cut of about 500 cords or 330,000 board feet of logs where the workers cut, skid and haul the timber. Where the workers do not skid or haul their cut timber, an annual cut of 750 cords or 500,000 board feet is required. If a sawmill is operated in conjunction with the logging enterprise, an annual output of 150,000 to 200,000 board feet will provide two men with full employment. These production requirements necessitate minimum forest farm areas of 1,000 to 2,000 acres (800 to 1,500 acres if a sawmill is operated) in the northern Lake States and areas about a third less than this size in the South. Estimated capital requirements for a full-time forest farm range from \$25,000 to \$70,000.

The author's analysis is based largely on case studies made in northwestern Wisconsin and in southwestern Arkansas. He uses these data to indicate that forest work provides a promising source of rural employment. He also examines the financial possibilities for successful forest farming in these areas and finds that it can be a profitable business. At the same time, however, he concludes that the prospects for forest farming are limited by a number of important factors. Among these limiting factors are listed: the scarcity of available lands adequately stocked with forest growth, high capital requirements, lack of managerial talent, lack of interest and incentive for forest farming in areas where stumpage is readily available from other private or from public lands, and the relative inefficiency of family-sized operations as compared with large-scale commercial logging.

The importance of these limiting factors leads the author to conclude that "it seems unlikely that full-time forest farming will take a large place in the rural economy of either of the regions studied. Part-time forest employment to supplement other farming ac-

tivities appears more applicable to the needs of the resident population and the prevailing level of social and economic development."

A number of public measures now in effect and designed to foster the advancement of forestry by small owners are briefly discussed in the final section. While the author is appreciative of the results achieved, he argues that "the various public programs have barely scratched the surface" in getting small operators interested in actually practicing forestry. To remedy this situation he argues that the public aid programs could and should be strengthened by offering "complete forest management service" to small and nonresident owners.

RALEIGH BARLOWE

*Cooperative agent, Michigan State College and
Bureau of Agricultural Economics.*

Historical Sociology: Its Origin and Development. Theories of Social Evolution from Cave Life to Atomic Bombing. Harry Elmer Barnes. New York, Philosophical Library. Pp. x & 186. \$3.00.

The well known historian of social ideas presents here a new cross-section of the history of social thought. He surveys the kinds of interrelationships, which have existed between sociology and the various concepts of history, such as Parallelism, Diffusionism, Determinism, etc. Moreover, he passes judgment upon many of such systems, rejecting the following two ways of looking at these problems: (1) The "skepticism" of Hobhouse and Ginsberg, who for example deny any interrelationship between economic structure and form of government and who, Barnes says, divide the forms of life of primitives arbitrarily and obtain from their studies what they had assumed at the outset in their preliminary classifications (p. 57); (2) The constructions of Spengler—a revival of romantic organicism (p. 106); Toynbee—an uncritical "Theodicy" (pp. 107f.); and Sorokin with his subjectively constructed categories and his attempt "to measure the immeasurable" (p. 112). In contrast to such persons Barnes finds merit in Howard Becker's work in the history of methodology (p. 3), Briffault's comparative method based on empirical material (p. 90), Max Weber's ideal type method (p. 60), and Boas' combination of parallelism and diffusionism (p. 75).

One might expect in a book which deals with so many theories that many of them would be incorporated incorrectly into the

historical sequence. But actually one can only find two such mistakes: (1) Ranke and his school (p. 12) have actually been of no importance in the development of sociological thinking. Rather this school has recognized only the existence of a history of foreign politics or insofar as they have taken the existence of social phenomena into consideration they were explained as caused by international relations. By so doing this group has actually hindered the development of a sociological thinking in Germany; (2) Bachofen was of far greater importance than appears in this book (p. 86) since he combined German Romantic interest in the original and often irrational feeling of people with parallel development and by that way has been of great influence on such persons as Frederic Engels and Karl Marx. Except for contesting these two points the reviewer must praise the correctness of the historical explanation and of the methods recommended. Especially is Barnes right in insisting that historically structured sociological systems are competent insofar as they are based on empirically collected material, systematized according to "ideal types." Barnes likewise is right in arguing that the latter may be used only if they are considered auxiliary constructions rather than metaphysical entities which some social theorists claim them to be. Actually, as Barnes points out, such "entities" are of purely subjective character.

PAUL HONIGSHEIM

Michigan State College

Report of the FAO Mission for Siam, Food and Agriculture Organization of The United Nations, New York: Columbia University Press, 1948, Pp. 125. \$1.50.

In this report, which was a result of three months intensive study of the economic and technical problems involved in the development of the agriculture and forest resources of Siam, the Mission specialists jointly present their recommendations regarding (1) Agricultural production, (2) Irrigation, (3) Control of rinderpest, (4) Forestry, (5) Economics of agriculture, (6) Agricultural statistics and (7) Agricultural services. To the agricultural economists, the chapter on Economics of Agriculture is particularly interesting. Here the investigators firmly grasp the importance of the rice economy of Siam, properly analyze it in the order of "Production Problems," "Marketing and Distribution of Rice," "Agricultural Credit," "Land Tenure" and "Co-operative Program"; and finally conclude with a "Plan of Agricultural Development."

The recommendations, 128 in number, are too numerous to quote in length. By and large, they are technical in nature. For this reason, however, they seemed to lack a clear-cut general outlook. The Mission recommended many things that would apply equally to almost any country without inquiring adequately into the causes of the present situation. The Mission also tended to avoid issues that involve political and social complications. For instance, it is no secret that the financing of the suggested program of agricultural development counts heavily on the profit from the export of rice under the monopoly of the Siamese government. The Mission, however, tried not to commit itself to the export monopoly as a system. It said that it does not feel qualified to advise upon such a policy.

At any rate, the programs of rice breeding, of fertilizer experiments, of rinderpest control, etc., are undoubtedly desirable; but if the programs had to move onto a social level such as distributing irrigation water or providing low-cost credit for tenant farmers, the reviewer feels that some of the recommendations would need further analysis.

B. K. SHAO

University of Wisconsin

Agricultural Extension Education in Poland, 1918-1939, Boleslaw J. Przedpelski, New York: King's Crown Press, 1948, Pp. x, 139.

The author states in his introduction that one of the pertinent objectives for this brief work is that of acquainting the rural worker with the Polish Educational Agricultural Movement that occurred between the two wars. This he proceeds to do on the descriptive level with great economy. The work is initiated with a brief historical summary of Poland and Polish agriculture, with emphasis on the various partitions and the eventual founding of the modern Polish State. Succeeding chapters are devoted to continued brief treatments of agricultural organizations in Poland; Chambers of Agriculture, units of agricultural self-government which are given central importance in agricultural adult education; the relationships of such Chambers to agricultural colleges and educational training centers for rural workers; general problems related to the development of agricultural extension education; a summary of statistics about Polish extension work; and a final chapter of summary comments with several references to the philosophy of extension work as it exists in the United States.

The core of this work is the descriptive treatment of the organizational structure of Polish Extension education, with the Chamber of Agriculture as the principal functional unit. The author points out the democratic aspects of this self-governing local unit centered in each province, with each province consisting of eight to twenty-seven counties. On the county level extension work was handled by general purpose voluntary agricultural organizations. Problems connected with such an organization included the lack of national and local integration, the weak relationships with agricultural colleges, and the difficulty of training and maintaining properly trained personnel. The principal educational method is described as that of the organization and management of small farms for demonstration and training purposes.

The author agrees with American students in that extension work is a socio-educational process. However, since this treatment is largely given to organizational structure, the reader may look in vain for more portrayal of the dynamic social and economic aspects of the Polish system which influenced people and local institutions. As a result, one tends to be lost in the organizational complex. A case treatment of a typical extension situation, for example, would have been helpful. Yet, since increasing interest is manifested throughout the world relative to extension work with rural people, this work adds, in spite of its brevity, to the knowledge with respect to adult education programs in rural areas.

PAUL A. MILLER

Michigan State College

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*Barnes, Harry Elmer, "Historical Sociology: Its Origin and Development. Theories of Social Evolution from Cave Life to Atomic Bombing," New York: Philosophical Library. Pp. 186. \$3.00.

*Chew, Arthur P., "Plowshares Into Swords, Agriculture in the World War Age," New York: Harper and Brothers, 1948. Pp. 221. \$3.00.

Cox, Joseph F. and Jackson, Lyman E., "Crops Management and Soil Conservation," Second Edition, New York: John Wiley and Sons. Pp. 572. \$3.80.

* Reviewed in this issue.

- *Ellis, Howard S, "A Survey of Contemporary Economics," Philadelphia. The Blakiston Company, 1948. Pp. 472. \$4.75.
- *Food and Agriculture Organization of the United Nations, "Report of the FAO Mission for Siam," New York: Columbia University Press, 1948. Pp. 125. \$1.50.
- ✓ Gadgil, D. R, "Economic Effects of Irrigation," Gokhale Institute of Politics and Economics, India, 1948. Pp. 183.
- Giedion, Siegfried, "Mechanization Takes Command," London: Oxford University Press, 1948. \$12.50.
- *Gustafson, A. F, Guise, C. H., Hamilton, W. J. Jr., and Ries H., (Cornell University). Third Edition. Ithaca: Comstock Publishing Company, 1949. Pp. 544. \$5.00.
- ✓ Instituto Nazionale de Economic Agraria, "The Situation of Agricultural Economics in Italy," Rome. 1948. Pp. 47.
- Joint Committee Report on "Extension Programs, Policies, and Goals," Washington, D. C: United States Government Printing Office, August 1948. Pp. 72.
- Lazarus, Herman and Goldberg, Joseph, "Collective Bargaining," Washington, D. C.: Public Affairs Institute, 1949. Pp. 72.
- Long, W. H. and Davies, G. M., "Farm Life in a Yorkshire Dae," Yorkshire, England: Dalesman Publishing Company, 1948. Pp. 111.
- ✓ National Planning Association, An Agricultural Committee Report, "Must We Have Food Surpluses," Planning Pamphlet No. 66, March 1949. \$0.50.
- ✓ Spiegel, Henry W., "Current Economic Problems," Philadelphia: The Blakiston Company, 1949. Pp. 726.
- Spiegel, Henry W., "The Brazilian Economy," Philadelphia: The Blakiston Company, 1949. Pp. 238. \$4.50.
- *Stoddard, Charles H., "Forest Farming and Rural Employment," Washington, D. C.: Charles Lathrop Pack Forestry Foundation, 1949. Pp. 29.
- Taylor, Carl and Associates, "Rural Life in the United States," New York: Alfred A. Knopf, 1949. Pp. 549. \$5.00.
- *Whetten, Nathan L., "Rural Mexico," Chicago: University of Chicago Press, 1948. Pp. 671. \$10.00.

NEWS NOTES

The American Institute of Cooperation is conducting two workshops at the University of Wisconsin, Madison, just preceding the institute's annual summer sessions, August 22 to 26. The first, from Aug. 8 to 19, is for teachers on a graduate level with Professor E. A. Perregaux of the University of Connecticut as chairman, and Frank Robotka of Iowa State College discussion leader. The second, from Aug. 15 to 19 is for extension workers with Professor W. H. Dankers, of the University of Minnesota, as chairman and Professor L. A. Bevan, Director of Extension at New Hampshire discussion leader.

A Southern Regional Summer School in Agricultural Marketing will be held at North Carolina State College, Raleigh, from June 16 to July 29, 1949. With the assistance of the General Education Board, ten fellowships for graduate students and ten scholarships for undergraduate students have been made available. Professors Marvin A. Schaars of Wisconsin and Geoffrey Shepherd of Iowa will be visiting faculty members. Special lecturers also will be invited to participate.

A number of administrative changes have been made at Michigan State College. Dr. Herman J. Wyngarden, Head of the Department of Economics, will become Dean of the School of Business and Public Service on July 1, 1949. On the same date, the Section of Agricultural Economics is to be transferred to the School of Agriculture to become part of a new department, which is also to include the Department of Farm Management.

The Department of Economics is to be transferred from the School of Science and Arts to the School of Business and Public Service.

The New York Milkshed Price Committee submitted its report on the pricing of Class I-A milk at a meeting at Syracuse, New York, Feb. 21, 1949. Copies of the complete text of the report of the New York Milkshed Price Committee are available upon request from Dr. C. J. Blanford, Market Administrator, New York Metropolitan Milk Marketing Area, 205 East 42nd St., New York City. Members of the committee were appointed by Dr. Blanford from Cornell, University of Connecticut, University of Vermont, New York University, Pennsylvania State College, St. Lawrence University, and Columbia University. They worked on the report from November, 1947 through January, 1949. Dr. F. F. Hill, Professor of Land Economics, Cornell University, was chairman.

A bulletin recently released by the Bureau of Agricultural Economics is the first publication to give a complete statistical series of estimates of bearing fruit acreages by crops and by states. It covers the years 1919-46 and is the result of several years' research in which available data were supplemented with additional surveys to arrive at reliable estimates.

Statisticians in the Bureau of Agricultural Economics have undertaken an investigation of the problems of estimating local-market supplies of vegetables for metropolitan areas. The Bureau's present estimates of commercial vegetable production do not cover all of the local-market segment of this production.

The students in the Departments of Agricultural Economics and of

Agricultural Administration at Mississippi State College have organized a student section of the American Farm Economic Association. The officers are: W. O. Davis, president; I. T. Jones, vice-president; R. E. McCollum, secretary-treasurer; and B. D. Jordon, reporter. Professor John C. Redman of the Department of Agricultural Economics is faculty advisor.

The Division of Field Crop Statistics of the Bureau of Agricultural Economics has begun the basic work of setting up the nation-wide wheat acreage survey which is to be made in June.

Ernest Ahrendes has returned to Montana State College after spending several weeks at Kansas State College for the Bureau of Agricultural Economics in studying the economics of feeding wheat to livestock.

John F. Alexander, working on a rental arrangement study; and John R. Shillinglaw and J. A. Smith assisting with a regional potato marketing project, have been added to the staff of the Department of Agricultural Economics and Rural Sociology as Assistant Agricultural Economists at Clemson Agricultural College. They are February graduates of Clemson.

Clifford Alston, Extension Marketing Specialist, University of Arkansas, is working toward a M.S. degree in business management at Cornell University.

Keith W. Amstutz, who completed his work for a M.S. at Purdue in February, has accepted a position as fieldman in the Illinois Farm Bureau Farm Management Service.

M. E. Andal, Agricultural Economist, Department of Agriculture, Ottawa, was the recipient of an Agricultural Institute of Canada scholarship and for the past year has been on leave of absence at Michigan State College where he has been taking graduate work.

Miss Elna Anderson, an Agricultural Economic Statistician, who had been on the staff of the Bureau of Agricultural Economics in the Division of Statistical and Historical Research for 26 years, died February 13, following a fall in her home in Alexandria, Va.

Mr. Olav V. Anderson, formerly with the Bureau of Agricultural Economics, has been appointed a member of the staff of the Fats and Oils Section, International Commodities Branch, Office of Foreign Agricultural Relations.

William Barr, Associate Professor of Farm Management, Pennsylvania State College, is on leave completing requirements for a doctorate in farm management at Cornell.

W. K. Bing resigned as Associate Professor at Kansas State College to accept a position with the Bureau of Agricultural Economics, Washington, D. C.

William Black has been employed by the North Central Regional Dairy Marketing Committee, and is stationed at the University of Wisconsin, Madison. Professor Geoffrey Shepherd is chairman of the regional committee.

M. C. Bond began sabbatical leave from Cornell University February 1. For two months he traveled through southern U. S. and Mexico and studied marketing for fruits and vegetables. He began work April 1 with the Federal Extension Service in Washington, D.C.

A. J. Boudreau, formerly on the staff of the Economics Department of the Superior School of Agriculture at Ste. Anne de la Pocatiere, Quebec, has been appointed a member of the Federal Civil Service Commission at Ottawa.

Glenn O. Bressler has returned to Pennsylvania State College where he will be a member of the staff of the Poultry Department. He has completed requirements for a Ph D. degree in farm management at Cornell.

Royal Jay Briggs, head of the Department of Social Sciences at Central Missouri State Colleges, Warrensburg, Mo., has completed the requirements for a Ph.D. at the University of Missouri.

Henry M. Brown has transferred to the Washington office of the Bureau of Agricultural Economics from the Agricultural Estimates office at Raleigh, North Carolina. He is working on estimates of cotton and other fiber crops.

Alvin G. Carpenter, Extension Economist, has been transferred to administrative work as Assistant Extension Director at the Utah State Agricultural College, Logan.

L. Wayne Cochran, former Research Assistant at the Giannini Foundation, University of California, has joined the staff of the Citrus Fruit Division, Fruit and Vegetable Branch, Production and Marketing Administration, United States Department of Agriculture.

T. K. Cowden, Vice-President of the American Farm Economic Association, has accepted an appointment as head of the new Department of Agricultural Economics, Michigan State College, effective about May 1, 1949. Dr. Cowden has been Director of Research, American Farm Bureau Federation, for the past six years.

L. C. Cunningham will be in Chicago during his sabbatical leave from Cornell University from February 1 to July 1. He will make an economic study of the commercial feed industry.

Subhas Dahr has completed requirements for a Ph.D. degree in land economics at Cornell University. He will work with FAO in Washington, D. C. for a few months before returning to India.

Herrell DeGraff has taken an eight month sabbatical leave from Cornell University. He is in Mexico studying agricultural conditions for the Rockefeller Foundation.

T. E. Doak has accepted the position of Assistant Dean of the College of Agriculture and Assistant Director of Experiment Station, University of Missouri. Mr. Doak has completed requirements for a doctorate in prices at Cornell University.

Ralph Eastwood, who has been with the Farm Credit Administration, Washington, D. C. has accepted a position with the Cooperative Grange League Federation in Ithaca, New York.

Marven Farrell, who recently completed work for Ph.D. at Harvard, has joined the staff of the Economics Department, Ontario Agricultural College, Guelph.

Rudolf Freund has joined the staff of the Department of Agricultural Economics on a joint basis with the Division of Social Studies, University of North Carolina. Dr. Freund will teach courses in agricultural policies,

land tenure, and agricultural industries. Dr. Freund received his undergraduate and graduate training in Germany and was associated with the University of Virginia prior to accepting a position at N. C. State College.

Dr. Charles D. Hyson and Mr. Ayers Brinser, until recently on the Economic Staff of the Federal Reserve Bank of Boston have joined the Agricultural Marketing Research Staff of Harvard University.

Milton C. Gay retired as economist in charge of the Fruit and Vegetable Section, Cooperative Research and Service Division, Farm Credit Administration on January 22. Mr. Gay was for many years extension marketing economist in Georgia and later the southern representative of a large-scale cooperative marketing fruits and vegetables.

Sidney Gershben has joined the staff of the Bureau of Agricultural Economics, Washington, and is assigned to the Division of Statistical and Historical Research, Fats and Oils Section.

Charles M. Hardin, of the Political Science Department of the University of Chicago, will serve as a special consultant in the Office of the Secretary of Agriculture during April, May, and June, 1949.

Clifford M. Hardin has been appointed Director of the Michigan Agricultural Experiment Station, effective July 1, 1949. He has been assistant director for the past year, and previously had been Chairman of the Section of Agricultural Economics.

V. B. Hart, Cornell University, has been appointed by the Secretary of the Treasury as a member of the National Agricultural Savings Bond Committee.

Cecil B. Haven has accepted a position of Assistant Professor in Agricultural Economics at the North Dakota Agricultural College. He is teaching courses in farm management and production economics and is in charge of research in the same field. He has been granted leave for the spring term of 1949 to complete his Ph.D. thesis at Iowa State College.

Harry C. Hensley retired as principal agricultural economist in the Fruit and Vegetable Section, Cooperative Research and Service Division, Farm Credit Administration, on February 1, 1949. Mr. Hensley for several years served as county agent, district agent, and extension economist in marketing in Missouri.

Louis F. Herrmann has recently returned to the Bureau of Agricultural Economics from five years on the staff of the National Cooperative Milk Producers' Federation. Dr. Herrmann is in charge of research on dairy and poultry marketing in the Division of Marketing and Transportation Research.

F. F. Hill, head of the Department of Agricultural Economics, Cornell University, was in England during January studying the agricultural program of the United Kingdom for the Economic Cooperation Administration.

Asher Hobson, University of Wisconsin, was recently elected Chairman of the Board of Trustees of the American Institute of Cooperation, succeeding Dean W. I. Meyers of Cornell.

M. N. Huda has completed requirements for a Ph.D. degree at Cornell. He plans to obtain training with the Bureau of Agricultural Economics in Washington, D. C. before returning to Pakistan.

Alfred H. Johnson has been appointed Assistant in Research in Agricultural Economics, Rhode Island State College. He is working on Egg Marketing.

Neil W. Johnson, recently Assistant Head of the Division of Farm Management and Costs, Bureau of Agricultural Economics, was appointed Special Assistant to the Administrator of the Agricultural Research Administration in charge of the new Central Project Office of the United States Department of Agriculture.

Paul E. Johnston, University of Illinois, has been granted leave of absence and has joined Overseas Consultants Inc. to aid in a study of economic conditions in Iran. He is in charge of a group of five agricultural men who arrived in Iran February 8 for four months.

J. R. S. Jorgens, who took graduate work at Washington State College, has joined the staff of the Economics Division of the University of Alberta, Canada.

M. S. Kendrick, on leave from Cornell University until September 1, is doing research and writing in taxation.

Walter E. Larmie has been appointed Assistant Extension Instructor in Marketing at Rhode Island State College. He is working on a cooperative project on the marketing of fruits and vegetables.

Marc C. Leager, for twenty years a member of the staff of the Basic Division, died on December 6, 1948. For the past several years Dr. Leager had been a joint member of the Department of Agricultural Economics and the Division of Social Studies, University of North Carolina. His field of interest was farm finance.

Myron W. Madison, Illinois '39, has joined the staff of the University of Illinois as first assistant in agricultural economics. He has been a fieldman in the Farm Bureau Farm Management Service and will help coordinate the work of the fieldmen in his new position.

James G. Maddox has been appointed to the staff of the American Basic Economic Corporation, which is financed by Nelson Rockefeller and Associates, to assist in the development of a habilitation loan program in South America, beginning in Venezuela.

John N. Mahan resigned from the Department of Agricultural Economics, University of North Carolina, to accept a position with the Tennessee Valley Authority. Mr. Mahan was a joint employee with the Bureau of Agricultural Economics on a regional dairy marketing research project.

W. W. McPherson, who has been pursuing graduate work at Harvard University, has joined the staff of the Department of Agricultural Economics of North Carolina State College. Mr. McPherson was formerly an employee of the Bureau of Agricultural Economics. He will divide his efforts between teaching and research in farm management.

W. I. Meyers, Dean of Agriculture, Cornell University, has accepted an appointment to the board of trustees of the Carnegie Institution of Washington, Washington, D. C. Dean Meyers is also chairman of the National Agricultural Savings Bond Committee.

Wm. H. Nicholls of the Department of Economics, Vanderbilt University, delivered on March 21st the first address before the newly organized Social Science Seminar at Mississippi State College.

James Miles, Associate Economist, Marketing Research, Clemson Agricultural College, is working on a doctor's degree in marketing at Cornell University.

E. G. Misner of the Department of Agricultural Economics, Cornell University, is on leave.

Clyde Mitchell has resigned from his position as president of the New Korea Company and is now at Harvard University preparing a report and analysis of the program developed under his administration, which sold back to the farmers of Korea 1,500,000 farms that had earlier been taken over by the Japanese Development Company.

Dr. J. L. Paschal has rejoined the staff of the Bureau of Agricultural Economics, with headquarters at Fort Collins, Colorado. He recently spent 6 months in Alaska and is now engaged in a study of phosphate fertilizers in Western States.

Reed A. Phillips has returned to the Bureau of Agricultural Economics, Washington, after an absence of several months. He heads the research on marketing of livestock in the Division of Marketing and Transportation Research.

Clarence E. Prentice has been appointed assistant professor (Extension) at Michigan State College. He will specialize in grain, bean, and sugar beet marketing. He was formerly county agent in Sanilac County, Michigan.

A. E. Richards, Principal Economist, Economics Division, Dept. of Agriculture, Ottawa, is a member of the Canadian delegation that will be meeting for a period of some months at Annecy, France, in connection with an extension of trade agreements originally drafted at Geneva and Havana in 1947.

Marvin A. Schaars, University of Wisconsin, will be on the staff of the North Carolina School of Agriculture and Forestry, Raleigh, for the summer session teaching two courses in agricultural marketing.

A. Z. Sheira, on leave from the Bureau of Agricultural Economics, Ministry of Agriculture, Cairo, Egypt, completed his M.S. degree in agricultural policy at the University of Illinois, and is continuing his graduate work in Agricultural Economics at Cornell University.

Edward J. Smith, formerly graduate assistant, has accepted a joint appointment with the Wisconsin Agricultural Experiment Station and the Bureau of Agricultural Economics, and will study the farm management problems in making and utilizing grass silage.

Thomas D. Spivey has transferred from the Bureau of Agricultural Economics, Washington, to the Tobacco and Tropical Products Division, International Commodities Branch, Office of Foreign Agricultural Relations, where he will work on statistics of tropical products.

Hugh L. Stewart has been appointed Assistant Head of the Division of Farm Management and Costs, Bureau of Agricultural Economics. This is in addition to his leadership of the Western Agriculture Section of the Division.

Proctor Thompson, Research Associate in Agricultural Economics at the University of Chicago, will join the faculty as Assistant Professor of Economics and Education, beginning in October, 1949.

Ralph D. Tompkin has joined the staff of Iowa State College after completing requirements for a M.S. degree at the University of Illinois.

A. H. Turner, formerly Director of Research, Department of Cooperation, Province of Saskatchewan, has joined the Economics Division, Department of Agriculture in Ottawa, where he will have charge of marketing research.

F. L. Underwood, formerly of Virginia Polytechnic Institute, has joined the staff of the Department of Agricultural Economics at the Oklahoma Agricultural and Mechanical College, Stillwater, and is now doing teaching and research in farm management.

Richard Wheeler, in charge, and W. Herbert Brown and Ernest N. Gould are the research staff working on the project in Dairy Farm Management under a grant from the Charles H. Hood Foundation at Harvard University. The project has recently been expanded to include a study of dairy-woodland combination farming in the farm-forest margin.

Clyde Z. Willis has transferred to the Washington office of the Bureau of Agricultural Economics from the Agricultural Estimates office at Raleigh. He is working on estimates of peanuts.

Martin Young has returned to the Fruit and Vegetable Branch Production and Marketing Administration, USDA, and has been assigned to the Dried Fruit Division. He recently returned from two years in Korea where he was Chief and later Adviser to the Korean Chief of the Bureau of Agriculture in Kyong Sang Namdo Province.

MEETING OF THE EXECUTIVE COMMITTEE
CLEVELAND, OHIO

December 30, 1948

Present: Murray, Wells, Hobson, Waite, Allin, Cowden, Wellman, Norton, and Simerl.

W. G. Murray opened the meeting and presented his report as President for 1948, and it was accepted. L. J. Norton reported that the tellers had reported to him that the following were elected as officers for 1949: President, Oris V. Wells, Bureau of Agricultural Economics; Vice-Presidents, Bushrod Allin, Bureau of Agricultural Economics, and Thomas Cowden, American Farm Bureau Federation; Secretary-Treasurer, L. H. Simerl, University of Illinois.

This was accepted and made a matter of record. Murray suggested that various departments of agricultural economics be notified of the new officers and of the dates of the 1949 annual meeting.

President Wells took the chair. An agenda for the meeting was presented and adopted. The past Secretary-Treasurer presented his annual report and the report of the Investment Committee. These were accepted. He also submitted the auditor's report which was accepted.

The following resolution was adopted:

"RESOLVED, that the Secretary-Treasurer, who is also chairman of the Investment Policy Committee, be and is hereby authorized and empowered for, and in the name and on behalf of this Association to take any and all such steps, and to do any and all such things as may be necessary, required, and appropriate for, or in connection with, the purchase, acquisition, acceptance, handling, pledging, sale, or other disposition of stocks, bonds, and other securities belonging to the Association or pertaining to its business including the execution and delivery for and in the name and on behalf of this Association, or any and all endorsements, transfers, and assignments of certificates of stocks, bonds, or other securities standing in the name of this Association, either for the purpose of sale or transfer, and all such other steps and action as may be necessary or proper in connection therewith."

The Champaign National Bank of Champaign, Illinois was designated as depository of the Association's funds.

The Committee approved a motion to provide for the bonding of the Secretary-Treasurer and his secretary.

The Editor presented his report which was accepted. The following resolution was unanimously adopted: The Committee on behalf of the Association expresses its commendation of the excellent work of Dr. Warren C. Waite as Editor of THE JOURNAL OF FARM ECONOMICS.

Walter W. Wilcox was appointed Editor of THE JOURNAL OF FARM ECONOMICS, for the ensuing year. A sum of seven hundred and fifty dollars was appropriated for technical editorial services (subject to review by the Executive Committee in August). The Editor was authorized to appoint two Assistant Editors.

A budget was adopted as follows:

PRO FORMA BUDGET FOR TWELVE-MONTH PERIOD

Income

Dues.	\$11,030
Back numbers sold... ..	1,000
Reprints sold .. .	300
Dividends and interest .. .	2,000
Advertising .. .	100
Total	<hr/> \$14,430

Expenses

Printing the JOURNAL.	\$ 9,000
Reprints... ..	900
Annual meeting	500
Back numbers... ..	200
Best article award.	100
Editorial expense	750
Executive Committee	300
Library custodian.. ..	25
Office supplies .. .	120
Postage and wires.	200
President's expense	150
Secretary's expense	1,550
Materials for agricultural policy volume	300
Index.. ..	150
Contingent reserve	185
Total	<hr/> \$14,430

A sum of \$1,500 was appropriated to defray a part of the costs of stenographic and clerical services in the office of the Secretary-Treasurer.

The Committee agreed to present to the members of the 1949 annual meeting the proposition of charging a registration fee of \$1.00 at subsequent annual meetings

It was agreed that extra copies of the 1949 Proceedings issue of the JOURNAL would be made available to the Western Farm Economics Association at a reasonable cost to be determined by the Editor and the Secretary-Treasurer of the American Farm Economic Association and the President of the Western Farm Economics Association.

The consensus of opinion of the Executive Committee is that: (1) The program suggested by the Special Awards Committee is too ambitious to be administered efficiently, at least in the first year; (2) the undergraduate essay proposal is impractical of administration; and (3) that the topic of agricultural policy should not be used for at least another year or two.

It was agreed that necessary expenses incident to the meritorious awards be met from the awards fund.

For the first year awards were approved as follows:

I Published report of research	
A. First award	\$ 500
B. Special awards, three at \$100 each.... .	300
II. Doctor's thesis	
First award... ..	250
B. Special awards, two at \$100 each. . . .	200
<hr/>	
Total	\$1,250

Reports of research submitted must bear a publication date of 1946, 1947, or 1948, and be readily available in quantity. Each of the awards in this group shall be in different fields.

Doctor's theses submitted for awards must have been accepted by the student's institution during the three years 1946, 1947, and 1948. Theses shall be submitted through the appropriate department head at each institution and only one thesis shall be accepted from each institution.

No paper shall receive more than one award, but a published Doctor's thesis may be submitted in both classes.

For some time the Association has accepted graduate students as junior members. In order to provide definite constitutional authorization for this practice the Committee agreed to submit the following amendment to the members: "The Executive Committee may establish a junior membership open only to graduate students. The annual dues for such membership shall be \$3.00 per year."

The Committee approved the participation in joint sessions with the American Economic Association in New York in 1949. The President was authorized to proceed with necessary arrangements.

It was recommended that the President appoint a marketing committee to work with the American Marketing Association.

The 1949 annual meeting will be held at the University of Wyoming, at Laramie, August 17 to 20.

The Executive Committee authorized the President to appoint a Membership Committee.

The members of the Executive Committee present unanimously agreed to hold the 1950 annual meeting at Montreat, North Carolina.

L. H. SIMERL, *Secretary-Treasurer*
ORIS V. WELLS, *President*

THE SOUTH AFRICAN JOURNAL OF ECONOMICS

EDITORS

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RURAL HEALTH AND THE TRUMAN PLAN

CALVIN W. STILLMAN*
Chicago, Illinois

A PROPRIETARY interest in "problems" seems to be one facet of our society, organized as we are into so many vocal interest-groups. The pattern seems to be to stamp a problem with one's adjective, and then to repel boarders. For instance in the matter of medical care, Fishbein says:¹

"The medical profession has insisted with remarkable unanimity that no other group except physicians is really entitled to say how medicine should be practiced, for only the physicians are competent by training and experience to judge adequately the quality of medical care. There is no criterion of adequate medical care except the quality of the care that is rendered."

One wonders whether there is not something to be said also for the quantity of medical care, and for the matter of allocation of the various qualities and quantities among all those persons who may be in need of medical care. Another view is Falk's:²

"Social and economic health measures are directed primarily to the effective organization of health facilities and to the adequate provision of health services. They are only secondarily concerned with the technology of medicine. The content of medicine is the physician's domain. But the circumstances under which he practices and his economic relation to society

* The writer wishes to express his appreciation for aid in preparation of this paper from Elin Anderson, Michael Davis, Lynn Doctor, Leonard Engel, Erven Long, and Louis S. Reed.

¹ Morris Fishbein, M.D., "The Doctor and the State," in *The Medical Profession and the Public*, American Academy of Political and Social Science, Philadelphia, Pa., 1934, p. 88.

² I. S. Falk, "An Introduction to National Problems in Medical Care," *Law and Contemporary Problems*, Vol. VI, No. 4, Autumn 1939, p. 500.

or to the individual patient are problems of organization, problems in the public domain in which the physician is only one among many who are vitally interested."

Research into the economic problems of medical care, and proposals for reform from within and without the ranks of the profession, have met the hostility and opposition of the most articulate segments of organized medicine. (The Physicians Forum and the Committee of Physicians for the Improvement of Medical Care, for example, have supported such reforms.) Each new development in public health has been bitterly fought;³ voluntary and philanthropic organizations interested in human welfare have been objects of suspicion⁴ and attack.⁵ Yet despite this apparently automatic reaction to novelty, the medical profession adjusts to each new development as a glacier slides down a valley; it maintains its frigid dignity, but it does move. The contemporary excitement over "socialized medicine" must be viewed in the light of the profession's record of opposition to all that is new.⁶ The day may even be in sight when the medical profession will welcome assistance from other disciplines in studying the problems of the distribution of medical care. Without waiting for this day to arrive, this paper is undertaken in an attempt to point out certain areas in which economics can contribute to a solution of the "medical" problem.

Definition of the Problem

It seems anomalous that we should have such a problem in the United States, yet as evidence that we do there are four major bills before Congress, and a message from the President.⁷ Advances in

³ Gaylord Anderson, "The Political Impact of Modern Science on Public Health," *Annals of the American Academy of Political and Social Science*, Vol. CCXLIX, January 1947.

⁴ Bernhard J. Stern, "Society and Medical Progress," Princeton University Press, Princeton, New Jersey, 1941.

⁵ J. G. Crownhart, "Sickness Insurance and the Propagandist Foundations," State Medical Society of Wisconsin, pamphlet, January 2, 1935. "Sickness insurance" is used to describe any insurance plan not in accord with the policies of organized medicine. "Health insurance" is used to describe approved plans.

⁶ The dean of the medical school of a Midwestern state university has defined "socialized medicine" in a conversation with the writer as "anything the AMA doesn't like."

⁷ The Administration's bill (S.1679) introduced by Senator Thomas and others, and the less controversial bills offered by Senators Taft (S.1581) and Hill (S.1456), and by Representative Javits and others (S.1790). The President delivered his message on April 23, 1949.

knowledge concerning disease have been notable in this century; the life expectancy of our population has soared; by many measures the nation has grown steadily healthier. Yet there exists a problem. What is it?

The problem is to find an institutional mechanism to bring together people and the medical care that is potentially theirs. Our great medical resources are not now giving their services at full capacity. Personnel and institutions specialized for medical care are not distributed in accordance with the needs of the population, nor are they organized to serve most efficiently the people within reach. Need for medical care exists wherever there are people. In our economy, means for providing medical care have grown up in relation to incomes, not to people and their needs for care. Most medical facilities concentrate in urban areas; these areas offer the highest purchase price for medical services. Rural people simply do not know what they are missing in modern medical care.

Statistics collected by the United States Public Health Service indicate that in rural areas rates of mortality are high, and rates of morbidity are high—for diseases classed as “preventable.” Most tragic is the fact that rural rates for maternal and infant mortality are particularly high.⁸ Mott and Roemer say in a summary paragraph of their invaluable volume on rural health,⁹

“People in cities have long looked on rural life as the healthful life, and 40 years ago in this country they were close to the truth. Rural people were then healthier as a group, the toll of fatal disease and premature death was much lower among them. But movements were already afoot and trends taking shape that were to mean progressive and rapid improvement in urban health, a dramatic advance only feebly reflected and far from paralleled by the lagging betterment of rural health during the same decades.”

The very nature of the organization of rural life makes difficult the necessary contacts between physician and patient. In 1940 only one fourth of all farms had telephones, and forty-two percent of all farm operators were without automobiles of any kind.¹⁰ It is the custom in many rural areas for the physician to charge one dollar

⁸ Statistics and special studies are published regularly in the Public Health Service's periodical, *Public Health Reports*. For summarized data on rural health statistics, see Frederick D. Mott, M.D., and Milton I. Roemer, M.D., “Rural Health and Medical Care,” McGraw-Hill, New York, 1948, chapters 4 through 7.

⁹ *Ibid.*, p. 49.

¹⁰ *Ibid.*, p. 35.

per mile for a home visit, in addition to his regular fee.¹¹ Distribution of medical services to rural people is more expensive, and their means of payment are less, than in urban areas. Rural people thus have an interest in the solution of the national problem of the distribution of medical care; few groups have more to gain.

Progress in medical knowledge from the horse-and-buggy stage has introduced three general problems which must be solved by a new institutional mechanism; by a new method of organization, in Falk's terminology. The problems as the economist sees them are those of complexity, cost, and concentration. These will be discussed in turn.

The Problem of Complexity

The vast and increasing scope of medical knowledge, compared with a generation ago, has been illustrated by Dr. Benjamin Miller through the example of training for general practice. For a doctor of today to become trained in all the fields of medicine offered by the traditional general practitioner would require an aggregate of internships lasting seventeen years. At the end of that time, says Dr. Miller, the earlier fields studied would have been so changed that it would be necessary to repeat them. The conscientious trainee for general practice would consequently never leave school.¹²

Not only is specialized training necessary for modern medicine; student doctors are taught to work with specialized aids of sorts rarely found far from hospitals. Modern medical care practically requires the existence of hospitals. Modern doctors learn to rely upon the trained assistance of nurses and technicians, and to use the highly-developed diagnostic aids available in X-ray, pathological, and bacteriological laboratories. The hospital itself provides an efficient center of operations for the physician dealing with the problems of his patient; everything he will need in a wide range of cases is at hand; other physicians consulted fit smoothly into the routine. In every case it is not necessary to call upon the services of several diagnostic aids, or to prescribe several complicated treatments, but

¹¹ For instance, "I live in a county that doesn't have an active practicing physician. The nearest physician is 22 miles away. The flat charge is a dollar a mile. The low income group in American agriculture simply doesn't get medical service from that kind of charge. They go without it . . ." Ransom E. Aldrich, "The Farmer's Medical Care Problem," *Journal of the American Medical Association*, Vol. CXXXI, No. 6, June 8, 1946, p. 553.

¹² Benjamin F. Miller, M.D., *You and Your Doctor*, Whittlesey House, New York, 1948, years required for interning in the various specialties are tabulated on page 17.

the fully-equipped hospital is a guarantee that when the need arises, the service is at hand. The advances in medicine which make possible cures in cases formerly hopeless require persons of many skills and these persons need the tools of their trades.

Good medical service for rural areas requires the existence of all health services, in proper supply. To the extent that the services are specialized—almost a synonym for modern—there must be a method of coordinating them. The supply of no health service is up to par in rural areas. Hospitals and diagnostic laboratories are in very short supply.¹³ The supply of physicians is far below par; the supply of specialists even further below.¹⁴ Although there are exceptions, and most rural physicians are hardworking and conscientious members of their communities, "the environment of country practice is one of continuous frustration and continuous inability to do the things that the thoughtful physician realizes are indicated . . . he rarely can find the opportunity to go away for a state medical society meeting, a refresher course, or postgraduate studies, and, after a while, he loses interest in the idea. As the years go by, he tends to become more firmly lodged in an intellectual rut, and soon the detail men from the various drug houses become his chief source of information on current therapeutics. . . . Even local medical societies, which might tend to provide a certain amount of ethical and professional guidance to practitioners, are as a rule much weaker in every way in rural counties than in the cities."¹⁵

The proliferation of new services in the medical world—each justified by its role in new methods of healing—has been accomplished within the framework of the fee-for-service system of medical billing. It is a canon of organized medicine that the physician's special skill at diagnosis and treatment extends to the field of charging for his service. To practice medicine has been interpreted as to be free to charge what one thinks best. When the services of several physicians are needed, therefore, there are as many separate bills, each an amount set by the physician concerned. Also, there are separate bills for hospitalization, and usually for each service offered by the hospital beyond room and routine food and nursing.

For the patient, enjoyment of the wonders of modern medicine requires a balancing of the possible merits of each suggested treatment with the probable cost. For the physicians concerned, each

¹³ Mott and Roemer, *op. cit.*, chapters 13, 14, 15.

¹⁴ *Ibid.*, chapter 8.

¹⁵ Mott and Roemer, *op. cit.*, p. 183.

can charge as a discriminating monopolist. Only the hospital and the services sold under its auspices are on a flat rate. For the patient, there may be the additional problem that the services needed are physically scattered. Thus a patient with an illness which might involve care of more than a routine sort faces a maze of special charges, some of them not to be determined until after the treatment has been given. His personal physician, who is responsible for guiding his choice and for suggesting the proper expenditures in the search for health, knows that his guidance must be tempered with an understanding of the patient's pocketbook. This obtains in the interest of the physician's own fee, if not in the interests of the patient.

Ability to pay for medical care has become a factor in medical judgment. The traditional "scaling down" of fees to persons of low income has become lost in the new world of institutionalized medicine. The individual's personal physician can scale his own fees up or down, but the hospital demands payment, and the specialist or the physician operating the diagnostic laboratory need have no charitable feelings toward a patient hitherto unknown to him. There are usually plenty of patients who can pay; if there are not, the physician can move to a place where his services are better rewarded.

There are two ways to take the dollar sign out of medical judgment. One is to provide all services at no charge. The other is to make a single charge for an entire treatment, whatever it entails. This charge may vary in proportion with the treatment given, but a single charge can be scaled to a patient's ability to pay; even if there is monopolistic billing, there is at least only one monopolistic proboscis in the pocketbook.

The device of charging once for a complete treatment has been developed by teams of physicians, usually with their own technicians and sometimes with a hospital as well, organized into "medical group practice." The underlying idea of group practice is that the patient is a single unit needing coordinated treatment, and the group attempts to pool its knowledge and skill in providing the treatment necessary. Physician members of a group are ordinarily representatives of complementary specialties. The patient can be examined by any or all of the physicians without leaving the office. The matter of payment is only loosely related to treatment. In many groups, payment is wholly divorced from treatment; these

groups use prepayment plans, or are organized specifically for patients by their industrial or labor organizations, with doctors on salaries.

Rural communities have experimented successfully with medical group practice, frequently in conjunction with prepayment plans. Perhaps the best known of these is the plan at Elk City, Oklahoma, sponsored by the Farmers' Union.¹⁶ Other plans, with or without prepayment plans, have been started in Nebraska, Texas, North Dakota, and other states.¹⁷

Varying types of experiments in reducing the barriers to rural health due to complexity and disorganization are those of the Bingham Associates Fund,¹⁸ aimed at bringing modern diagnostic techniques to rural Maine, and of the Commonwealth Fund,¹⁹ dealing with the coordination of the services of hospitals in the neighborhood of Rochester, New York.

Medical societies have been bitterly hostile to the principle of group practice, whether organized under the auspices of their own members or upon the initiative of laymen. The American Medical Association got its fingers burned for abetting the Washington, D.C., Medical Society in the latter's struggle to kill off an early plan, Group Health Association, Inc.²⁰ The Supreme Court's decision was handed down in January, 1943. Ever since then, the battle has been carried on at the state and county medical-society levels; fired by latent dislike rather than clear editorial directives from the medical press. The number of medical groups in the nation still is not large, partly as a result of this local opposition. The device is extremely interesting, however, and has received attention from

¹⁶ For a spirited account of the early history of this plan, see Michael A. Shadd, *A Doctor for the People*, Vanguard Press, New York, 1939.

¹⁷ See, for instance, Elin L. Anderson, "Adequate Medical Care for Rural Families," *Journal of Home Economics*, XXXVI, No. 7, September 1944, and the publications of the Cooperative Health Federation of America, 343 South Dearborn St., Chicago, Ill.

¹⁸ "The Bingham Associates Fund," pamphlet published by the Fund, 80 Bennet Street, Boston, Massachusetts, April 1945. Samuel Proger, M.D., "Distribution of Medical Care," *Journal of the American Medical Association*, CXXIV, March 25, 1944, pp. 823-826. Leonard Engel, "The Bingham Plan," *Scientific American*, Vol. CLXXIX, October, 1948.

¹⁹ Mott and Roemer, *op. cit.*, pp. 455-456, and the annual reports of the Commonwealth Fund, 41 East 57th Street, New York 22, N. Y.

²⁰ The Department of Justice successfully brought action against AMA, the District of Columbia Medical Society, and other defendants under the Sherman Act. Most interesting is the evidence secured by the Government by subpoena of the records of the AMA's Bureau of Medical Economics. This evidence is published in the Record on Appeal with the proceedings of the Circuit Court. The judicial history is to be found in 26 Fed Supp 429, 110 Fed 2nd 703, and 317 U.S. 519.

many physicians seriously interested in improving the organization of medical care.²¹

The Problem of Cost

Cost of medical care has an economic significance distinct from its role within the problem of complexity and the effect of discrete unit costs upon medical judgment and treatment prescribed. Medical needs are unpredictable, and peculiarly subject to inelasticities of demand on the part of the afflicted person. Few budgets can handle the charges for a serious illness. Treatment for conditions requiring expensive care over long periods has been recognized as too great a charge upon individuals, and public assumption of these charges has long been the rule. It surprises some persons to learn that three-fourths of all hospital beds in the nation are in government hospitals; that about half of all beds in the country are occupied by mental patients. Mental disease, tuberculosis, and certain chronic and degenerative diseases have been "socialized" for many years in this country.²²

For all the magnitude of the charges for a serious illness, the incidence is so low that the average family does not appear to have a problem. For many years the total cost of medical care, measured as a share of consumer budgets or as a share of the national income, has hovered around four percent. This fact is used by the American Medical Association in arguing that there is no problem of cost in medical care.²³ Invidious comparisons are drawn with the larger

²¹ See "An Annotated Bibliography of Group Practice," pamphlet, American Medical Association, 1948, and G. Halsey Hunt, M.D., and Marcus Goldstein as listed in this bibliography, and succeeding articles in their study of group practice under the auspices of the Public Health Service.

The enthusiastic distrust of organized medicine for innovations suggested from without reached a point during the 80th Congress where government employees were actually fearful of discussing health problems with farm groups. See in this connection "Investigation of the Participation of Federal Officials in the Formation and Operation of Health Workshops," Third Intermediate Report of the Committee on Expenditures in the Executive Departments, 80th Congress, 1st Session. House Report No. 786, July 2, 1947; Hon. Forest A. Harness, "Forcing Socialized Medicine on America by the Use of Federal Employees and Government Money," *Arizona Medicine*, vol. V, No. 1, January 1948; "Rural Health Problems Considered and Policies Adopted at Meetings of Grange and Farm Bureau in Columbus," *Ohio State Medical Journal*, vol. XLIV, No. 1, January 1948.

For a general treatment of the manner in which opinion is formed and controlled within the medical profession, see Oliver Garceau, "The Political Life of the American Medical Association," Harvard University Press, Cambridge, Mass., 1941.

²² An authoritative source for all hospital statistics is the annual "Hospital Number" of the *Journal of the American Medical Association*, published every Spring.

²³ Frank G. Dickinson, "Is Medical Care Expensive?" American Medical Association, Chicago, pamphlet, 1947.

fractions of the national income accounted for by non-essential items. But the importance of a medical cost is not in its average size. It is in the impact of the cost upon the family or individual which must handle this among its other economic adjustments. If there is a magnitude to be measured in medical costs, it is the magnitude of their variation, not their average size.²⁴

Medical care insurance is the obvious mechanism to eliminate the magnitude of variation in cost of medical care. This has been recognized grudgingly by organized medicine only within the last five years. The history of health insurance in this country in the last fifteen years is a story of steady back-tracking by the medical profession. The Committee on Costs of Medical Care reported in 1932 that group practice and voluntary health insurance would help in a solution of the problem of distributing medical care. The editorial reaction of the medical profession was intemperate in the extreme.²⁵

Prepaid hospitalization insurance with benefits on a service basis sprang up in the early 1930's, despite opposition of organized medicine. The plans prospered, and banded together under the trademark "Blue Cross." Medical approval in principle followed after the success of the plans was assured. Special legislation was sought by hospital administrators to excuse their prepayment plans from the rules for insurance companies.²⁶ Starting about a decade ago, insurgent state medical societies ventured into forbidden territory and began instituting prepaid medical care plans of their own devising. The leaders in this movement were the medical societies of California, Pennsylvania, Massachusetts, Michigan, and New Jersey.

²⁴ A classic statement of this concept is to be found in I. S. Falk, Margaret C. Klem, and Nathan Sinai, "The Incidence of Illness and the Receipt and Costs of Medical Care among Representative Families," (Publication of the Committee on the Costs of Medical Care, No. 26, University of Chicago Press, Chicago, 1933, pp. 234-235.) Phraseology of this sentence is borrowed from that report.

²⁵ See editorials in the *Journal of the American Medical Association*, Vol. IC, No. 23, December 3, 1932, and Vol. IC, No. 24, December 10, 1932. Years later an explanation was made for the extreme position of those days, at least implicitly, in Morris Fishbein, M.D., "The Public Relations of Modern Medicine," *Journal of the American Medical Association*, Vol. CXXX, No. 8, February 28, 1946. The report proper is "Medical Care for the American People; the Final Report of the Committee on the Costs of Medical Care." University of Chicago Press, Chicago, 1932.

²⁶ C. Rufus Rorem, "Enabling Legislation for Non-profit Hospital Service Plans," *Law and Contemporary Problems*, Vol. VI, No. 4, Autumn 1939. The early laws specified certain representation on boards of directors; for instance that one third of the board be practicing physicians, and one third hospital administrators. This is important in that there is recognition that a hospital should be dominated by no single professional group if it is to give its best service. For an excellent presentation of the philosophy of the hospital, see Henry J. Southmayd, "Small Community Hospitals," The Commonwealth Fund, New York, 1944.

Special legislation was sought to help these plans also, but with an important difference—legislation was urged by medical societies in forms which would guarantee complete medical control of every aspect of the prepayment process.²⁷ This had the effect of killing plans proposed by lay groups, particularly those to be organized as cooperatives or as adjuncts of group practices

In 1945 the American Medical Association capitulated to prepayment plans organized by medical societies, and began sponsoring the device as a means of combating the rising threat of national health insurance. At its June, 1949, meeting, the Association changed fronts in the matter of consumer-sponsored medical prepayment plans, by announcing that these may be tolerated if they meet certain specified conditions. Since the most effective weapons at the disposal of medical societies are in the hands of the county societies, this revised attitude does not guarantee that any actual change will take place.²⁸

The principle of health insurance has been so well accepted by now that its extension is central to the four major bills before the Congress. The Taft and Hill bills propose governmental aids to the extension of health insurance plans organized in accordance with the views of the medical societies; the Javits bill proposes governmental aid to consumer-controlled cooperative voluntary health plans; the Administration bill proposes nation-wide compulsory health insurance financed by payroll deductions. The Javits and the Administration bills provide for contributions in proportion to

²⁷ See Richard R. Cranmer, M.D., "Medical Care Incorporated," *Bulletin of the Hennepin County Medical Society*, Vol. XIX, No. 1, January 1948, for the story of the drafting of the desired legislation in Minnesota, also William J. Burns, "The Michigan Enabling Act for Non-profit Medical Care Plans," *Law and Contemporary Problems*, Vol. VI, No. 4, Autumn 1939, and Hartley F. Peart and Howard Hassard, "The Organization of California Physicians' Service," *Ibid.* For a recent summary of the monopolistic aspects of this type of restrictive legislation, see "Restrictions on Free Enterprise in Medicine," pamphlet, Committee on Research in Medical Economics, 1790 Broadway, New York; and Margaret Klem, "Recent State Legislation Concerning Prepayment Medical Care," *Social Security Bulletin*, Vol. X, No. 1, January 1947. The best overall study of voluntary plans organized by hospitals and by medical societies is Louis S. Reed, "Blue Cross and Medical Service Plans," U S Public Health Service, Washington, October 1947, processed.

²⁸ See William L. Laurence, "AMA Lists Health Plan Tests with Local Units as Judges," *New York Times*, Friday, June 10, 1949. The weapons at the disposal of county medical societies are expulsion of offending physicians, and actions leading to exclusion from practice in local hospitals. See J. W. Holloway, Jr., "Hospitals and the Selection of Medical Staffs," *Wisconsin Medical Journal*, Vol. XLII, No. 11, November 1948. Also see the record of the AMA's trial in the Group Health case, *op. cit.*

income, the Taft and Hill bills do not. It is alleged that after a few more years, the voluntary plans will attain the coverage visualized for the compulsory plan. Certainly recent growth of voluntary plans has been amazingly rapid, but there is reason to believe that this is to be accounted for by the late appearance of many of the plans, and by the even later endorsement and promotion of them by the medical profession. A survey of the present coverage of voluntary health insurance shows that Blue Cross hospitalization plans cover about 33 million persons in the United States, of whom 60 percent live in six industrial states. These plans will cover about one-fifth of a family's total medical costs.

Medical society prepayment plans ("Blue Shield") cover about ten million persons, practically all of whom also have Blue Cross coverage. Over 85 percent of these persons are in seven high-income states. These plans do not cover all medical needs. Most frequently, they cover only surgical or obstetrical charges, when the patient is in a hospital. Some plans also pay for such items as care given in the doctor's office. All physicians' services in a hospital amount to about fourteen percent of the total medical bill of an average family. Blue Cross and Medical Society plans together, then, will cover about 35 percent of the charge for a serious illness.

Comprehensive service plans, such as that at Elk City and others organized by consumers through cooperatives, unions, industrial health plans, etc., cover between three and three and one-half million persons in many plans scattered over the country. Such plans cover nearly all medical costs.

Commercial insurance policies have been sold to about twenty million people. These policies are characterized by a low ratio of benefits to premiums paid, and like most Blue Cross and increasing numbers of Medical Society plans, benefits are paid in the form of cash payments, unrelated to the actual size of the bill received. The usefulness of these policies is further limited by the fact that many people with some form of unfavorable medical history, and therefore usually in most urgent need of coverage, are either not eligible for health insurance or else have riders attached to their policies precluding payment for any recurrence of a pre-existing ailment. These are often the persons most ruinously crippled financially by persisting ill health.

These figures conceal an unknown amount of duplication, since many persons hold commercial policies as well as Blue Cross mem-

bership or membership in other health plans.²⁹ Of all these millions, how many are rural people? Secretary Anderson said in January, 1948, "Prepayment plans for surgical and other medical services offered by State and county medical societies have today reached less than one percent of the country people."³⁰

Requirement of group membership is usual for Blue Cross and Medical Society health plans; groups ordinarily are comprised of the employees of a factory, an office, or another institution capable of subtracting dues from a payroll. A voluntary health plan requires for safety a reasonably heterogeneous clientele, and one large enough to spread the risk. Every such plan has barriers to membership aimed at decreasing the claim ratio for the plan as a whole. It is safer to enroll people in groups classed on some basis such as a common place of employment, than to allow individuals to select themselves as clients on the basis of their probable future needs for medical care. This means that the health of the plan in a financial sense may militate against the health of just the individuals who most need medical care. These people are not allowed to join, for they would take more in benefits than they would bring in premiums. By the same token, longtime members of a voluntary plan may be dropped summarily for reaching a certain age, or for incurring a condition which is liable to be a precursor of more charges. Rural populations, needless to say, are not easily handled through group enrollments, nor can their premiums ordinarily be paid through payroll deductions.³¹

The existence of a prepayment plan is one thing; the policies of its controlling body is another. There is room for administrative judgment within the limits of financial solvency. Shall the plan be attuned to the special needs of the consumers, or to the special interests of the individuals who provide the services? Medical Soci-

²⁹ This information is taken from a report prepared by Katherine G. Clark for the Committee on Research in Medical Economics, 1790 Broadway, New York City, March 1949.

³⁰ Margaret C. Klem and Margaret F. McKiever, "Program Developments and Benefit Trends in Voluntary Health Insurance," *Social Security Bulletin*, November 1948, p. 4.

³¹ A personal letter by the writer to the headquarters of Associated Medical Care Plans, Inc., the trade association of the Medical Society prepayment plans, elicited the information that nothing is being done at present to increase rural enrollments, but that Blue Cross plans in thirty-seven states have made provision for enrolling groups of farm people, and that in twenty-seven states, it is possible to join Blue Cross without being a member of an organized group.

ety plans have been attacked severely for ignoring the needs of the consumer and for catering to the interests of physicians.³²

When service to the consumer is the guiding motive, a prepayment plan can contribute to a marked increase in the amount of medical care even a relatively isolated community can obtain. A good example is the combined group practice and prepayment plan of the Trinity Hospital, Little Rock, Arkansas. This plan serves persons from all parts of the community with very few membership restrictions, and handles the added liabilities of aged clients through modest increases in their premiums. Margaret Klem has estimated that,

"The volume of services received by Trinity subscribers and their dependents was comparable with that purchased by persons with annual incomes of \$10,000 or more who paid about four times as much for the services received on a fee-for-service basis."³³

It should be emphasized that this prepayment plan is on a service-indemnity basis, not cash-indemnity. To what extent the difference in cost of the medical care received is attributable to better coordination of services, and to what extent to elimination of separate discriminatory monopolistic charges, would make an interesting study. Were cash-indemnity the rule instead of service, monopolistic charging would remain.

The Farm Security Administration conducted experiments with prepaid medical care for its clients for a number of years. The plans set up were financial failures, but subscribers benefited and their physicians benefited. The first year's report of one plan shows a rate of 1,409 medical treatments per thousand members, which is to be compared with a rate of 526 treatments per thousand members of the general rural population.³⁴

The medical profession sanctioned these plans as long as they were approved by the local medical society. Approval was usually forthcoming; the federal subsidies that were necessary to keep the plans afloat meant fewer unpaid medical bills. For instance,

"One physician in Ohio told of 36 families, now members of the unit, who, prior to the establishment of the FSA plan, had received service from him.

³² See Michael M. Davis, "Health Insurance Plans under Medical Societies," *Medical Care*; I Vol III, No. 3, August 1943; II, Vol IV, No. 1, February 1944.

³³ Margaret C. Klem, "Medical Services Provided under Prepayment Arrangements at Trinity Hospital, Little Rock, Arkansas, 1941," *Social Security Bulletin*, May 1947, p. 8

³⁴ Mott and Roemer, *op cit*, p. 418.

Of total charges of \$900 only \$150 could be collected. If these families had had a group plan at that time, he would have received about \$700 at the present rate of payment."³⁵

The FSA prepayment plans were doomed to financial failure because they were limited to persons with high medical needs and low incomes. The purchasing power of any prepayment plan is limited by the size of its clientele, the rate of illness, and the levels of premiums the subscribers can pay. Needless to say FSA clients could not afford much even in monthly instalments; not nearly enough to buy themselves complete health care. Added to this, membership was voluntary, and membership became highly correlated with incipient need for treatment. Prepayment can pool a group's risk, but it cannot raise the level of the pool.³⁶

The Problem of Concentration

"Under any system, if a doctor is a good one, he's bound to go where he can make a good living. Under the present system of individual fees-for-service, doctors go where folks have dough."³⁷

This quotation gives an important reason for the concentration of doctors—and other health facilities—in areas of high per capita income. The quotation suggests that equalizing effective demand for medical care would automatically bring about a distribution of health services more in accordance with physiological need. This is too much to expect, however. In the long run, equalized medical purchasing power would lead to a far more equal distribution of medical facilities than we have at present, but there would still exist differences in locating factors for physicians and other mobile medical services.

The very existence of crowded cities is an attractive force for medical centers. More people close together mean more chances to treat rare and interesting diseases; highly specialized personnel will still prefer to locate near persons and equipment highly specialized and complementary. The dispersed nature of rural populations means that medical facilities to serve them can never be the same as those best fitted for urban areas. Properly planned to meet local

³⁵ Franz Goldmann, M.D., "Medical Care for Farmers," *Medical Care*, Vol. III, No. 1, February 1943, p. 29.

³⁶ An interesting study is that of Robert L. McNamara and A. R. Mangus, "Prepayment Medical Care Plans for Low-income Farmers in Ohio," *Agricultural Experiment Station Bulletin* 658, Wooster, October 1944.

³⁷ Paul de Kruif, *Kaiser Wakes the Doctors*, Harcourt, Brace, New York, 1948, pp. 78-79.

conditions, however, rural health services can provide most of the necessary treatments, and unusual cases can be sent to urban centers.³⁸

Equalizing purchasing power is a prerequisite for equalized medical service, but it is not sufficient, for hospitals do not grow like mushrooms. In the short run, medical facilities required in medically impoverished areas can be supplied through no other means than public funds. This is the objective of the Hospital Survey and Construction Act of 1946, which calls for a survey of the hospital needs of every state, and for grants in aid for construction of hospitals in areas not adequately served. A section of the law requires that the community needing a hospital be wealthy enough to support it, once built. The effectiveness of this law naturally depends upon a device for equalizing medical purchasing power; many communities needing hospitals cannot now afford their support.³⁹

The dimensions of the differences between farm and urban income are greater than one might suppose.

"Passing over the strikingly low prewar farm income figures revealed by the 1939 Census of Agriculture and coming up to the period when the war was having a marked influence on farm incomes, we may recall that in 1941 half of all farm operators had annual net cash incomes of less than \$760 per family, including income from all non-agricultural sources. As the war went on, farm income soared to unprecedented heights, but the disparity between farm and city income levels was still far from eliminated. In 1943, when farm income was approaching its peak, the total net income from all sources of persons on farms was only 12 percent of the national income, although farm people made up 20.5 percent of the population that year. The serious disadvantage of the families looking to the soil for their main livelihood, moreover, is seen in the remarkable fact that the per capita net income in 1943 of all persons in the United States not living on farms was twice as high as persons on farms."⁴⁰

Differences in medical buying power are regional differences, rural-urban differences, farm *versus* non-farm differences; they are differences that allow large communities to enjoy one level of adequacy of medical care, and pen up other large communities at lower levels. No private voluntary insurance plan can equalize

³⁸ For a plan of rural health centers and hospitals, organized in a state-wide network with supporting city hospitals and medical centers, see "Hospital Resources and Needs," *Report of the Michigan Hospital Survey*, W. K. Kellogg Foundation, Battle Creek, Mich., 1946.

³⁹ Written statement submitted by the U. S. Public Health Service, Hearings on S.614, May 4, 1949.

⁴⁰ Mott and Roemer, *op. cit.*, p. 479.

these levels. Localized plans—even one with an entire state for its scope—can do no more than equalize risk within the area covered. No such plan can raise the buying-power for the group as a whole. This is a compelling argument for a national system of equalizing medical buying power, a system inclusive of all areas and all communities, all risks pooled in one fund, and the purchasing power of the fund made available for the benefit of everyone. This is the type of solution envisaged by the Administration in its proposal for compulsory national health insurance.

Compulsory health insurance would be administered as part of the nation's social security framework. Payroll deductions in proportion to income would comprise the cost to the individual. Benefits would come in the form of comprehensive services; practitioners and hospitals would be recompensed by the appropriate administering agency. For employed persons, costs would be close to the average now paid by all families for medical care. This means elimination of uncertainty at no added average cost. Complete coverage, healthy persons along with sickly, guarantees a favorable risk ratio.

According to an official source, "Contributions equivalent to about three percent of annual earnings would pay for adequate basic medical and hospital services for both workers and their dependents. A more comprehensive system would cost the equivalent of about four percent. These costs would be no more than now is spent by families on the average. They are less than the average expenditure by families in the low income groups, since, contrary to the general impression, low-income families spend, on the average, a larger proportion of their incomes for medical care than families in better circumstances, though—because of their more frequent and severe illness—they receive much less in relation to what they need."⁴¹

For everyone, compulsory health insurance should plow down the hills of unpredictable cost and fill the open spaces with a regular premium keyed to income. The same levelling would apply to medical purchasing power interpersonally; the city man with a dependable salary would have as much ability to pay a doctor as a man trying to dry-farm in New Mexico. This alone would not bring the same care to each man, of course, but one barrier would be removed.

⁴¹ I. S. Falk and Wilbur J. Cohen, "Social Security for Farm People," this *Journal*, Vol. XXVIII, No. 1, February 1946, pp. 93-94.

Farmers stand to gain from this type of inter-regional levelling of purchasing power. Whereas the national average expenditure for medical care is about four percent of the family's income, a study indicates that in 1941 medical care was taking 8.7 percent of the average farm family's net cash income.⁴²

The Social Security Administration estimates that there is now an excess capacity in doctors' services of about 25 percent. An immediate effect of compulsory national health insurance can be expected to be an increase in health services supplied by some such amount.⁴³ In the longer run more doctors and hospitals would be needed, and these much better distributed. With national compulsory insurance, there would be the purchasing power to hold in place medical service facilities properly planned to serve the people who need them.

The Administration's Bill

Bills for compulsory health insurance of the same general nature have been introduced by Democratic members of Congress since 1938.⁴⁴ Since 1945, with passage looming as a possibility, the medical profession has become increasingly active in opposition to these bills. The profession's arguments have not been dignified by presentation of facts and their logical discussion. Rather the medical contentions have been couched in emotionally-charged adjectives, and in allegations of insidious motives. For all the furor, there is nothing really new about the Administration's present bill, except that it might pass.

In view of the foregoing analysis of the medical problem in the United States, it is of interest to dissect the Administration's current national health bill title by title.

Title I declares the existence of a shortage in medically-trained personnel, and provides for grants to states for medical scholarships, and to medical schools. The existence of a shortage is largely predicated upon the increase in effective demand which would follow enactment of national compulsory health insurance.

Title II provides for an acceleration of research into certain prob-

⁴² Mott and Roemer, *op. cit.*, p. 308.

⁴³ George Soule, "The Costs of Health Insurance," pamphlet published under the auspices of the Committee on Research in Medical Economics, Inc., New York City, and the Public Affairs Institute, Washington, D. C., April 1949.

⁴⁴ Harold Maslow, "The Background of the Wagner National Health Bill," *Law and Contemporary Problems*, Vol. VI, No. 4, Autumn 1939, provides a running start on the legislative history of compulsory health insurance

lems of poliomyelitis, diabetes, arthritis, epilepsy, and other diseases.

Title III amends, extends, and increases authorized appropriations under the Hospital Survey and Construction Act for hospital construction in underprivileged areas.

Title IV provides special aids for rural and other shortage areas. These are,

Grants and loans to trained personnel to encourage their moving to underprivileged areas.

Grants to aid construction or operation of group practice facilities, clinics, hospitals, etc., including ambulances and mobile clinics

Grants to enable professional personnel in shortage areas to return to medical centers for refresher training.

Grants and other aid to farmers' experimental health cooperatives.

Title V provides for grants to states for public health work.

Title VI provides for research and grants to the states for maternal and child health services.

Title VII provides for compulsory health insurance, but without taxing clauses. These are reserved for a separate bill. Fiscal arrangements are to be handled through a "Personal Health Services Account" on the books of the Treasury, into which would be paid all contributions from covered persons, and what appropriations become necessary. Administration is provided through state channels, and subordinate "health-service areas."

Nothing comparable in scope to the Administration's health plan has been proposed by any other bill before Congress. The novelty and potential difficulties of the plan proposed must be measured not by past methods of organizing medical care, but by the medical needs as yet unmet. To contradict Dr. Fishbein, we *must* think also of the quantity of medical care provided in our society. The cooperation of physicians is essential to any plan of medical care, of course, and there is no reason to believe that such cooperation would not be forthcoming in the proposed national insurance system. For doctors don't gain when they lose patients with several perfectly good years of life left in them. It would be better all around, perhaps, if the medical profession were more prone to cooperate in the solution of this "medical" problem, and less prone to preserve the past by ignoring the present.

THEORY: DEFINITION AND PURPOSE

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I

AT THE last National Agricultural Outlook Conference speakers were heard repeatedly making observations like the following:

- (1) "We do not engage in theoretical research, ours is the job of analyzing the facts in such a way as to provide practical guidance to farmers, farm organizations and other agricultural agencies "
- (2) "We use outlook information as a means of attracting attention and stimulating interest on the part of farm audiences so that we can then teach them economic principles."

Concealed in these two statements is a number one confusion in the minds of too many professional and academic economists. It is the purpose here to explain this confusion and to show some of its consequences, for practical theory is a generalization of means-consequence relationships that serves as an aid in determining a future course of action.

Why would any research economist ever say that he doesn't engage in theoretical research? And why would anyone think of the teaching of economic principles as a goal distinct from formulating a future course of action? Every scientific effort to analyze the facts so as to anticipate the future and guide action requires the use of a variety of concepts or mental tools. And an economic principle is an expected repetition of a past relationship that has practical significance for future action.

The only reason a research economist ever says he doesn't engage in theoretical research is to be found in the double meaning of the word "theory." It can mean either "pure" theory or "practical" theory. When he makes such a statement, the word to him means pure theory, which is "intellectual speculation without reference to practical application."¹ This is the same meaning as that implied by another economist who says that "the notion that economics is a science explanatory of behavior is the most important single con-

* This is to acknowledge constructive suggestions and criticisms from Howard L. Parsons, D. B. DeLoach and other colleagues and friends, especially those of the Graduate Seminar at the University of Wisconsin.

¹ Stated orally to the writer by Professor Ragnar Frisch, University of Oslo.

fusion in the methodology of the science."² Pure theory is logical reasoning from assumed premises. Such reasoning need not describe reality nor serve any useful purpose.

Practical theory, on the other hand, is a generalization that is developed as a basis for judgment with respect to action. It is a forecast of future consequences for the purpose of dealing with practical problems.³ Thus, two reasons exist for the persistence in popular discussion of a conflict between theory and practice: (1) The fact that theories never intended to have practical significance satisfy the purposes of the theorist, and (2) the fact that theories intended to serve practical purposes often turn out to be wrong.⁴ To deny any connection with the "theoretical" and to lay claim only to the "practical" is merely to disavow either a pure theory that happens to be useless for any kind of action or a theory that was intended to be useful and turned out to be a mistake. In other words, to be theoretical is not necessarily to be impractical.

If we can assume that those who would distinguish between outlook and the teaching of economic principles are interested only in practical theory or principles, they are really distinguishing between the kind of forecasting usually associated with outlook information and all other kinds of forecasting. The former is a set of conclusions concerning future prices, incomes and quantities based on an analysis of all the relevant collective influences. The latter, on the other hand, might include among other things the forecasting of an individual farmer's income under alternative assumptions as to how he might manage his own farm—given a set of forecasts regarding the collective influences. In either case, interest in teach-

² Frank H. Knight, *The Ethics of Competition*, p. 279.

³ "... Often the word theory, or theoretical, is a name of reproach uttered by the practical man who claims to be dealing only with Facts . . . But the practical man is a theorist when he predicts that the prices of stocks will rise and therefore buys as much as he can. If, instead, the prices fall and he is bankrupt, it is not because he is practical but because his theory was wrong. He did not analyze all the facts; . . . did not guide his practice by a correct theory. He was a poor theorizer. Hence the word theory means a correct or incorrect insight among the limiting and complementary factors. It is not a fact, but a prediction of facts. If correct, then it is an insight that will fit all the future facts needed. If not correct, then it is simply a blunder and needs correction." By John R. Commons, *Institutional Economics*, Macmillan Co., N. Y., 1936, p. 102.

⁴ But it should not be inferred that practical theory is necessarily impure, bad, or biased; or that pure theory is always useless for dealing with practical problems. The search for "truth for truth's sake" has turned up ideas that later proved to be of very great practical importance. The intention is only to point out that the difference in meaning of the two concepts is so great that the interchangeable use of the word "theory" to convey both meanings is a constant cause of confusion.

ing "principles" might refer only to teaching the "why" of the conclusions developed, so as to give the farmer a proper degree of confidence in them—to avoid a tendency on his part either to take them on faith or to ignore them entirely.

II

Now I have been told by some of my colleagues that any discussion of ambiguities such as those referred to above would be trite so far as most economists are concerned—that it would be a discussion of the obvious. Perhaps so. Yet, it is difficult to escape the conclusion that it is precisely this *failure to distinguish pure theory from practical theory that has resulted in a widespread tendency among economists to apply pure theory to practical problems without making necessary allowances for the premises of such theory*. Untenable conclusions and inferences are reached because the "analytical model" or theory is not fitted either to the facts of the problems or the purposes of the analyst. One of the most persistent sources of fallacies arising from this practice is the indiscriminate use of the "pure competition model" of equilibrium theory in agriculture. And some of the most conspicuous examples to occur recently have been discussions of the "malallocation" of resources and the "inefficiency" of American agriculture.⁵

When economists undertake to compare the efficiency of agriculture with that of industry, or to form some judgments concerning the allocation of resources within agriculture or as between agriculture and industry, they have to decide first what they mean by efficiency, what resources they are talking about, and what their standards are for changing their allocation. The definitions and standards they choose are determined by the purposes they have in mind.⁶ If their purpose is merely to engage in an exercise in

⁵ Theodore W. Schultz, "How Efficient is American Agriculture," this *Journal*, August 1947.

⁶ It is often said that one definition is as good as another provided we use it always with the same meaning. But is this so? Each definition must be fitted to the purpose we have in mind. If our purpose is simply to "speculate"—to find universal, timeless, and absolute "truth"—we can use a pure theory definition and always use it with the same meaning. If this definition were used consistently, the practical man would be told at the outset not necessarily to expect any identity between theory and practice. But if our purpose is to understand and deal with a practical problem, the meaning we give the term must fit that purpose. We must define theory as "mental tools useful for dealing with practical problems." Under this definition, "mental tools" that turn out to be useless in practice are bad theory—at least for the purpose at hand.

logic, it makes little difference what definition or standards they choose, so long as everything they say is logical. But when the practical implications of their analyses are. (1) That American agriculture is inefficient; (2) that resources are more badly allocated in agriculture than in the rest of the economy; and (3) that the economy generally would be more efficient if it functioned in conformity with the pure competition theory—when these are the implications of their reasoning, my reply is they had better examine the criteria by which their judgments were reached.

III

First, let us consider the conclusion that American agriculture is inefficient. This conclusion is derived by arbitrarily selecting for the meaning of "efficiency" the meaning associated with pure competition theory, and then implying that others either do mean or should mean the same thing when they say American agriculture is efficient.

This pure competition meaning of efficiency is, "When all resources in the economy are allocated so that no further gain can be achieved by an additional transfer of a factor or product from one use to another use, 'maximum economic efficiency' is achieved. This would represent the ideal, the general equilibrium of economic analysis."

It is recognized, of course, that there are other meanings of efficiency such as output of corn per acre of land, per man hour of labor, etc. But these are called "technical" rather than "economic." Yet, it is precisely these so-called technical meanings that others have in mind when they say American agriculture is efficient. And they cannot be proved wrong by implying that they should mean something else. No evidence has ever been presented to show they are wrong if the term "efficiency" is given the same meaning as they attach to it.

Under the pure competition model, it is possible to identify *rate* of output per unit of comparable input with *value* of output per unit of comparable input by the assumption of equilibrium. When the economy is in equilibrium, goods exchange in proportion to the marginal *dollar* cost of producing them. This becomes identical with marginal *labor* cost because it is assumed that comparable labor can and does flow promptly from one employment to another so that at equal rates of pay there is no discrepancy between dollar

cost and labor cost. But this is all pure theory and requires drastic modification for practical use.

When the pure competition theorists talk about "economic inefficiency" of American agriculture, they do not mean a low *rate* of output per unit of input; they mean "waste" of resources, largely of manpower. They mean that some agricultural labor either is used to produce goods that are less wanted than other goods or is not used to produce any goods—in *which case it never becomes "input."* They mean that agriculture is "inefficient" because it adopted "gadgets" and "improved farm management" faster than it reduced its birthrate, and that the resulting surplus farm population has failed to go to town to make more "gadgets." They mean that agriculture is "inefficient" either because its *total* output of agricultural products has been too great or because too large a total of agricultural labor is producing nothing.

That these conditions exist among the rural population is in no sense an "agricultural" phenomenon as such, nor is there any evidence to suggest that over any business cycle any larger proportion of available manpower is unemployed or underemployed in agriculture than in the rest of the economy. Economic efficiency in this sense is "double-barreled" and applies to the whole economy, the nonagricultural as well as the agricultural segments. It not only refers to the aggregate output of all goods and services, but also to the "proportioning" of that output as between the different goods and services. Under the first meaning, a given economy might be more "efficient" than another because it works longer hours rather than because it is more effective per hour. And under the second meaning, relative prices can be used as a measure of a "proper" proportioning only under the twin assumptions of pure competition and virtuous human beings. If any "moral" value whatever attaches to this meaning, it is more than doubtful that the economy would be more "efficient" if some of the boys and girls from our more efficient Iowa farms moved to town to become bartenders and barmaids merely because they could make more money at these occupations.

In any event, no such tortuous reasoning is required to recognize the obvious fact that at least since the Civil War there has been chronic involuntary underemployment and unemployment of manpower in the South. This is the consequence of a complex of social, political, racial and economic issues that cannot be treated by

merely referring to it as the "cake of custom." Actions on the civil rights and educational fronts must at least accompany those on the "economic" fronts. It is not an "agricultural" phenomenon as much as it is a "social" phenomenon. It is "dichotomous" mal-allocation in the sense that it refers to both farm and nonfarm populations.

The tendency to think of it as "agricultural" rests on an assumption that either relatively or absolutely more labor power on farms than off farms is "wasted." If this is true, the evidence to support it is far from conclusive. And even if it were a demonstrated fact, it would have nothing to do with the question of agricultural efficiency as a rate of output. There is no more reason for counting the unused or underused labor on farms as agricultural "input" in calculating the agricultural efficiency ratio than for counting it as manufacturing input in computing the industrial efficiency ratio. For "social" reasons it is not input for either agriculture or industry. All of which suggests the need for explaining another fallacy that logically follows from uncritical use of pure competition theory—that a purely competitive society would be more efficient than the one we now have.

IV

This, again, may be a "valid" conclusion if the assumptions of pure competition theory are granted, but it is not "true" in any practical or pragmatic sense. When an economist implies that it is true as well as valid he is living in the last century when the assumption in classical doctrine that the productive resources of capital and labor were so fluid that they flowed readily from one profit-making opening to another was more nearly supported by observable facts than it is today. It is much less true today of a large part of American industry, where mass-production methods have led to the creation of great units which alone can exploit the new technology. If one believes that our economy as a whole is more efficient because of this kind of exploitation of modern technology, one cannot at the same time believe that "atomistic" competition would be most efficient. To do so, would be to believe in the "fallacy of nonconcomitant or inaccessible options." Even if the ideal of substantially pure competition were attainable or accessible, one cannot hope to enjoy its benefits at the same time

he enjoys those of mass production "fair" competition. In plainer words, we cannot have our cake and eat it too.

If our national policy of fostering "reasonable" competition in order to realize the "social" benefits of modern technology—a policy affirmed by a long succession of Supreme Court decisions—is our deliberate choice, we must expect both the continued existence and the periodic recurrence of substantial "pockets" of "wasted" manpower. That is, we must expect it until these pockets become so large as to be unmanageable. The Maximum Employment Act of 1946 is recognition of the necessity for keeping them manageable. Under pure competition, of course, there would be no need for such measures.

The "social" costs of the policy we are following include our various social security measures, minimum wages for labor, parity prices for farmers and many others. We should do everything possible to eliminate these pockets of underemployed and unemployed manpower, but it would be something less than realistic to believe this can be done in conformity with the pure competition model—unless we are prepared to sacrifice at the same time the advantages of mass production technology with its inevitable accompaniment of "administered" prices.

Herein also lies a fallacy of all "forward" price proposals involving "equilibrium" prices and compensatory payments—at least so far as the allocation of manpower between agriculture and industry is concerned. If the compensatory payments were "fair" they would be higher to low-income farmers than to high-income farmers, and they would tend to remove the economic pressure on such farmers to migrate to nonfarm employments. Within agriculture, of course, resources will tend to be allocated in accordance with the "pattern" of prices, at least to the extent that agriculture is actually competitive. But even here prices alone cannot be depended upon to do all that is needed or desirable. They will be effective only where both the *opportunity* for choices and the *willingness and ability* to make choices exist.

To say that agriculture is less efficient than industry because the *value* of output per man in agriculture is less, is precisely like saying that schoolteachers are less efficient than bricklayers because they receive fewer dollars per person. And to say that American agriculture is inefficient is to imply that it can be made more efficient.

Any realistic discussion of improvements in efficiency must take into account the available alternatives. Unless this is done, any talk about inefficiency is mere words without meaning. Practical public policy can never be derived by "comparing the idealized conditions . . . and actual circumstances . . . and developing the necessary positive steps required to eliminate the discrepancy."⁷ Excessive preoccupation with the "ideal" is the usual consequence of formal model or pure theory approaches to public policy. An *attainable ideal* is always the *best available choice*. The principles by which action with reference to choices is formulated is practical theory.

In summary, then, theory is of two kinds: Pure theory and practical theory. When the lessons learned from pure theory are incorporated into practical theory, full account must be taken of the *assumptions* underlying the pure theory and appropriate adjustments should be made therefor. If this had been done by those currently discussing the "inefficiency" of American agriculture and the malallocation of resources in agriculture it is more than doubtful that they would have arrived at the conclusion that American agriculture is inefficient, they probably would not have implied that resources are more badly allocated in agriculture than in the rest of the economy, and they would not have left the impression that they think a freely competitive economy is more efficient than our "administered price" or "reasonably" competitive economy. If their purpose was to deal with some of the practical questions raised by these issues, they would have chosen definitions of terms to fit that purpose. For practical theory is not the mere logic of mathematics which is the language of numbers; it is also the *meanings* of words.

Karl Mannheim, in his *Ideology and Utopia*, clearly describes the causes of the theory-practice conflict when he says, "The fact that sciences are cultivated in academic surroundings constitutes a danger in that the attitudes adequate to the understanding of an actual sector of human experience are suppressed in the contemplative atmosphere which prevails in academic institutions. Today we almost take it for granted that science begins when it destroys our original approach and replaces it by one which is foreign to living experience. This is the most important reason why practice

⁷ D. Gale Johnson, *Forward Prices for Agriculture*, The University of Chicago Press, 1947, p. 11.

cannot profit by this kind of theory. This creates a tension between theory and practice which is increasingly aggravated by modern intellectualism. Summing up the main difference between this contemplative, intellectualistic point of view and the living standpoint which is accepted in the realm of practice, we might say that the scientist always approaches his subject-matter with an ordering and schematizing tendency, whereas the practical man—in our case the political person—seeks orientation with reference to action. The desire for concrete orientation leads us to view things only in the context of the life-situations in which they occur. A schematically ordered summary tears apart the organic interconnection in order to arrive at an ordered system which, although artificially constructed, is nevertheless occasionally useful.”

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ACTUARIAL STRUCTURES FOR CROP INSURANCE

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CROP insurance is conceived as a device which can be used by a farmer to stabilize his income against partial or complete crop failure to the extent that this failure is due to adverse weather or to related adverse physical crop conditions which are beyond his control. As such a device, or with various modifications, crop insurance has been tried in every major country in the world. The forms, coverages, and general provisions have varied widely. In some cases, the attempt has been made to provide general protection against any or all factors which cause low yields. At other times protection has been restricted to specific risks such as hail, flood and insect damage.

The method of sponsorship or of financial support has varied. In the United States until the passage of the Federal Crop Insurance Act in 1938 all attempts at crop insurance were by private companies. But in other countries crop insurance nearly always appeared under government sponsorship. In most cases it has been offered to farmers as a voluntary contract. In some other cases, notably in Japan and in the U. S. S. R., it has been compulsory. In the Canadian prairie provinces a compulsory wheat tax plan having some insurance features has been in operation since 1939. In the United States the Federal Crop Insurance Act passed in 1938 offers the outstanding example of an attempt to apply a voluntary crop insurance plan over a wide area.¹

* This paper presents some of the principal findings and conclusions which are contained in my Ph.D. dissertation, "The Theory of Crop Insurance," which was submitted to the University of Chicago in 1948. I am grateful for the assistance and suggestions given to me by several of my colleagues. I particularly wish to express my appreciation to D. Gale Johnson who, as chairman of the dissertation committee, gave me valuable advice in the development of the dissertation; to T. W. Schultz who encouraged me to proceed with my original suggestion and who carefully reviewed this paper, to Milton Friedman whose rigorous criticism helped me to improve my dissertation manuscript; to Rainer Schickele, M. M. Kelso and G. E. Korzan who have given me the benefits of their comments in reviewing this work. Several other friends and associates have helped me by their appraisal of certain points.

¹ A large number of studies of crop insurance, of a comprehensive and empirical nature, are available. Some of the recent articles which have been found most enlightening are: F. Arcoleo, "Crop Insurance," *International Review of Agriculture*, Rome, International Institute of Agriculture, XXXI (1940), 271-76E, 306-16E; J. C. Clendenin, "Federal Crop Insurance in Operation," *Wheat Studies of the Food Research Institute*, XVIII (1942), 227-90; Dale E. McCarty, "Wheat Yield Insur-

In spite of rather general and enthusiastic support of the idea of voluntary crop insurance and in spite of strenuous efforts to establish such programs, in almost every case voluntary crop insurance plans have failed on at least one of two counts. Either they have failed to attract the large majority of farmers or they have failed to approximate a self-supporting situation.²

The failure to attract participation of the majority of farmers suggests that many farmers have not looked with favor on the premium-indemnity schedule and may have considered that they could maximize their income over time by remaining outside the program.³ The failure of the plans to become self-supporting suggests that adverse selectivity must have been widespread, farmers with better than average expectations of collecting indemnities being the ones most frequently attracted to the program. This failure of voluntary crop insurance raises two basic questions: Is it possible to design and to administer these programs so that they will be attractive to the large majority of farmers and so become self-supporting? Or will it be necessary, in order to obtain widespread participation, to turn to compulsory insurance or to insurance that is heavily subsidized? A strong case may be presented

ance," this *Journal*, XXXIII (1941), 664-67; R. E. Motherwell, "A Study of Crop Insurance," *Report of the Saskatchewan Reconstruction Council*, Appendix 3, Regina, Saskatchewan 1944; Ray F. Pengra, "Crop Production in the Semi-Arid Regions on Insurable Risk," this *Journal*, XXIX (1947), 567-70; President's Committee on Crop Insurance, *Report and Recommendations of the President's Committee on Crop Insurance*, House Document No. 150, 75th Congress, 1st Session, 1937; B. D. Raskopf and E. B. Fickle, *Cotton Crop Insurance in Tennessee and United States*, University of Tennessee Rural Research Series, Monograph No. 198 (1946); Raskopf and Fickle, *Wheat Crop Insurance in Tennessee and United States*; *ibid.*, No. 197 (1946); F. H. Sanderson, "A Specific-Risk Scheme for Wheat Crop Insurance," this *Journal*, XXV (1943), 759-76; Andrew Stewart, "Stabilization of the Income of the Primary Producer," *Canadian Journal of Economics and Political Science*, XI (1945), 359-72; S. E. Wrather, "Adaptation of Crop Insurance to Tobacco," this *Journal*, XXV (1943), 410-18. Since 1937, extensive congressional hearings have been held on the subject of crop insurance. Several issues of *The Agricultural Finance Review* and *The Agricultural Situation*, published by the United States Department of Agriculture, have carried short articles on this subject.

² Exhaustive study of the references listed in the preceding footnote and other source material serves as background for this statement. Experience of the Federal Crop Insurance Corporation (hereafter abbreviated as FCIC) may be cited as an example. The crop year 1947 was the first time that premium collections of the FCIC exceeded indemnity payments on combined operations for all commodities. In this year, however, wheat acreage insured was 72 percent of total acreage insured among all crops, and wheat yields generally were well above average. Up to 1947, the losses incurred in the writing of insurance totaled about 90 million dollars in addition to operating expenses paid for by current appropriations. At the height of participation in the wheat program in 1940 about 20.7 percent of the seeded acreage of wheat in the United States was insured.

³ Cf. Clendenin, *op cit.*, pp. 260-61.

for compulsory crop insurance or for insurance involving subsidy.⁴ Compulsory crop insurance, however, may be resisted by farmers on social-political grounds and on the grounds that premiums, at various times, would exceed the discounted value of the probable indemnity. Insurance involving subsidy also may have important adverse effects on the efficiency of resource utilization.⁵ Therefore, a voluntary contract not involving substantial subsidy is to be preferred.

Forms of Voluntary Insurance

In the discussion which follows, the forms which voluntary crop insurance plans may take are outlined; and the conditions necessary to establish a crop insurance program to meet actuarial requirements are examined. Such a program is defined as fulfilling the following conditions: (1) It would protect a farmer against partial or complete crop failure, to the extent that this failure is due to the adversity of weather and related physical crop conditions beyond his control, and (2) protection would be offered under such a premium-indemnity schedule that all farmers facing similar probabilities for indemnities would be assessed similar premiums. Fulfillment of the latter provision would mean that no farmer would be penalized or subsidized consistently through the use of insurance. Under this condition, the insurance contract could be attractive to any farmer who wished to reduce the income uncertainty caused by fluctuating physical crop conditions and it could be designed to eliminate the necessity for recurring subsidy due to indemnities continuing in excess of premiums.⁶

⁴ For the line which the argument for compulsory insurance might take, see A. C. Pigou, *The Economics of Welfare*, London: Macmillan and Company, 1920, pp 902-11. The subsidy which would bring about the widespread use of crop insurance on a non-compulsory basis might be considerably less than the amount of money which has been spent on feed and seed loans, direct relief payments, disaster payments, etc.

⁵ It might encourage the growing of wheat on land which is "sub-marginal" for wheat production, for instance. Thus it might cause a misallocation of resources toward wheat production. Some cases have been found where flax growing was encouraged by insurance on land on which flax would not be grown in the absence of insurance. Incidentally, feed and seed loans or direct relief may be protested on similar grounds. Too many resources may be funneled into an area in relation to marginal productivity of the land in the area.

⁶ Only experience can determine what proportion of farmers would buy such insurance and what size reserves an insurance corporation should carry. There can be little doubt but that an actuarially sound program in the United States would have paid several billion dollars to farmers during the drouth period of the 1930's if a large majority of the farmers of the United States had been insured. Also during

The analysis is restricted to three different plans for crop insurance distinguished by the methods by which premiums and indemnities are calculated. These three plans are called all-risk crop insurance, area-yield insurance, and weather-crop insurance. The conclusions, which may be applied generally, are stated with reference to the United States.

All-risk crop insurance. In all-risk crop insurance a base yield is established for each farm—such as the average yield experienced on that farm in a 10-year period. Insurance is offered to cover either 50 percent or 75 percent of the base yield. If the actual yield in any year falls below the insured yield, an indemnity, equal to the difference between insured yield and actual yield is payable to the insured farmer. Premiums are assumed to be uniform over a county and are based on an estimate of the average indemnity payable in the county over a period of years.⁷ For example, if a farmer's average yield of wheat for a 10-year period were 20 bushels per acre, his insured yield at the 75 percent level would be 15 bushels per acre. If he received 10 bushels per acre some year his indemnity for that year would be 5 bushels for each acre insured.

Area-yield insurance. In the area-yield insurance plan, premiums and indemnities are based on the yield received in an area of normally uniform crop conditions which may vary in size from a township or part of a township to a county or more. Indemnities are paid to any insured farmer in any year in which the mean area-yield for the year falls below a specified level (the level may be defined as some percentage of the expected or normal yield for the

the years from 1941 to 1948, aggregate premiums would have exceeded indemnities by several billion dollars. Aggregate gains vs. losses in any year or over a period of years should not be used as the criterion of success or failure in a crop insurance program. Instead, the analysis must distinguish between the losses which may be due to incorrect actuarial procedure and those which may occur from time to time because of adverse crop conditions.

The use of a compulsory contract is not ruled out in this analysis. Insurance might be made compulsory in some areas through operation of a crop insurance district which might be established under a "crop insurance district law" much as weed districts are now established under a "weed district law." Also lenders might require the use of insurance as a condition for extension of credit. But under any case the first task is conceived as one of perfecting the actuarial structure.

⁷ The FCIC attempted to establish an individual premium rate for each farm based on the probabilities of indemnity for that farm. After a few years' trial it was decided that this method was not practical because of inaccurate or inadequate data and by 1946 nearly all crop insurance in the United States was sold under uniform county-wide premium rates. In 1947 in Chouteau County, Montana, for example, the county-wide premium rate for insuring winter wheat on summer fallow for 75 percent of the base yield of the farm was 1.8 bushels per acre.

area). For example, if the normal yield of wheat of an area were 20 bushels per acre, if the yield in a given year were 16 bushels per acre, and if the insured were a wheat farmer insuring for the normal area-yield, he would receive the equivalent of four bushels of wheat for each acre he insured regardless of his wheat yield on his farm. If he were insured for 90 percent of the normal area-yield his insured level would be 18 bushels per acre and his indemnity would be two bushels per acre. All farmers in an area would be offered a common schedule for insuring area-yields which would offer options of insuring for normal area-yield, for 90 percent, for 80 percent, and on down to about 50 percent of the normal area-yield. Corresponding to this schedule there would be a schedule of premiums specifying the premium to be charged per acre. The premium rates would be based on the estimated amount of indemnities payable under each of the indemnity options.

Weather-crop insurance. In the weather-crop insurance, premiums and indemnities are based on the weather records of the locality in which insurance is to be sold. Indemnities would be paid to any insured farmer in any year in which the weather, in terms of some measureable criterion, is beyond certain limits of tolerance. For example, if the mean annual rainfall in an area were 25 inches, which is assumed to be near the optimum for crop production in this case, a farmer might wish to insure against the possibility of occurrence of less than 18 inches or more than 32 inches of rainfall. He may be offered an indemnity schedule showing the indemnity he would receive providing mean annual rainfall is 17 inches, 16 inches, 15 inches, or less, and 33 inches, 34 inches, or more. Additional schedules could be provided for farmers who wished to insure against the probability of rainfall being less than 20 or more than 30 inches, less than 16 or more than 34 inches, and so on. For each schedule, a definite premium would be assessed. The premiums and indemnities could be stated in terms of amounts of produce or money for an insured acre. Factors in addition to rainfall such as temperature, evaporation, or hail might be included in the formula.

The process of analysis which follows is (a) to apply stated assumptions to each of the forms of crop insurance, and (b) to relax these assumptions one at a time, observing the effect of this relaxation on the respective crop insurance program.

All-Risk Crop Insurance

Basic assumptions. The first assumptions are (1) that the secular trend value for yields on each farm in a county is zero, (2) that the average deviation of yields from the mean is the same for all the farms, and (3) that the mean yield is the same for all the farms. If these assumptions are realized the premiums paid by a farmer using all-risk insurance should be equal to indemnities over a long period of time.⁸ No net gain or net loss should be experienced. The effect of such insurance would be to reduce the fluctuations in income caused by yield variations.

As the first assumption listed above is relaxed, it is assumed that the level of yields changes on individual farms. Under the new assumption, farmers with increasing yields would find that the aggregate premiums for a 15- or 20-year period would be in excess of the sum of the indemnities and conversely for farmers with decreasing yields. Without some compensating device, the first group of farmers would have net losses and the second group would receive windfall gains through the use of insurance.

The use of a moving average as the base for insured yield and use of a system of dividends for farmers with low indemnities might reduce the inequities otherwise found in the upward or downward trend. The system of dividends could not eliminate the inequity completely, however, because of the lag inherent in the adjustment. A more serious criticism which applies to the use of a moving average is that insured yields would not be consistent with yield probabilities. After a series of poor yield years on an individual farm, for instance, insured yields would be reduced to the point where a farmer should drop the insurance.⁹ After a series of good years the insured yield might be so high that the farmer would have a good chance of obtaining a windfall gain if he should continue with in-

⁸ This would be true under the condition that administrative expenses, or loadings, are paid by the Federal Government. If administrative expenses are paid out of premium receipts, then gross premiums, equal to net premiums plus loadings, would be equal to aggregate indemnities. It is a matter of policy, which is not examined at this point, whether administrative expenses should be paid out of gross premiums or be paid by the Federal Government. The latter is assumed but this assumption does not appear as a necessary condition in the analysis.

⁹ In many counties in Montana, the Dakotas, Nebraska, and Kansas, poor crops were experienced in 1940 and 1941. The FCIC raised premium rates and cut insured yields on the basis of this experience at the same time that prospects appeared good for the 1942 crop. As a result participation declined sharply, Cf. Clendennin, *op. cit.*, p. 261.

surance. Under such conditions an adverse selectivity is probable ¹⁰

When the second assumption is relaxed and it is assumed that the average variation of yields is not the same for all farms, the farmers having the larger yield variations would receive larger indemnities in years of poor crops than those farmers with smaller yield variations. The difficulty of working out an individual actuarial schedule for each farm which would reflect this situation is readily apparent from a study of farm yield data. Even if this could be done the desirability of doing so is questionable because a series of unusually wide yield variations on a farm, or a series of low yield variations, might cause the calculated indemnity probability to be at variance with the actual yield probability.

The individual farms in a given area may differ widely in respect to average yields.¹¹ When the third assumption is relaxed various degrees of the following situations may develop. If the actual deviation from the mean yield in bushels or pounds is the same for all farms, the farmers with low average yields would receive indemnities more often and in larger amounts than the farmers with higher yields.¹² If the deviation of yields in terms of percentage of mean yields is the same for all farms, the farmers with the higher average yields would receive larger indemnities in poor crop years than the farmers with low average yields. In order for there to be no inherent cause for an adverse selectivity, the indemnity for

¹⁰ Under this condition an adverse selectivity could develop through time independently of the type of adverse selectivity which might develop among a group of farmers in any particular year. It should be noted that the use of early deadlines for insuring or of a "continuous" contract could not completely overcome this difficulty. Early deadlines have been recommended elsewhere. See Clendenin, *op cit.*, pp 248-50. In 1946 the FCIC instituted a "continuous" contract which would be subject to annual cancellation by either the farmer or the corporation. A three-year contract was being used for wheat. See *Agricultural Finance Review*, IX (1946), 71.

¹¹ The following data are presented for all farms on the AAA listing sheets in Chouteau County, Montana, to indicate the wide range in yields which may exist in some cases:

Average Yield 1925-32 Bushels per Acre	No. of Farms
0-5	212
5 1-10	496
10.1-15	320
15 1-20	126
20.1-25	64
Over 25	51
Total	1,269

¹² This conclusion is valid only under the condition that farmers insure for less than their mean yield, say 75 percent of mean yield or less

each class of farmers ranked according to yield would have to be potentially equal for the entire universe of farms which were eligible for a common premium rate. The fulfillment of this condition appears to be out of the question.¹³

Effect of increasing accuracy of farmers' expectations If farmers grow more than one crop and if they vary the acreage of crop to be insured from year to year, an additional factor involving adverse selectivity may appear. In years when yield prospects are relatively poor, the discounted value of the crop in terms of expectations will be greater for an insured crop acre than for an uninsured acre. In years when yield prospects are relatively good, the opposite case will exist because the insurance premium will appear as a cost and the net discounted value of the crop in terms of expectations will be less for an insured crop acre than for an uninsured acre. In the former case, therefore, there would be a tendency on the part of the farmer to increase the insured acreage and in the latter case there would be a tendency to reduce the insured acreage. If insured acreage on a farm can be varied, the tendency for an adverse selectivity to develop would depend on the extent to which crop yields can be predicted prior to seeding.¹⁴

Two factors may enter into the farmer's yield estimate: (1) general weather conditions, soil moisture, insect conditions, etc.,

¹³ There may be a tendency toward the fulfillment of the condition although the relationship might be termed highly haphazard. If the standard deviation of yields is higher on high yielding farms than on low yielding farms, and if the coefficient of variability is greater on the low yielding farms than on the high yielding farms, there would be a tendency toward fulfillment. There is some evidence that such a tendency does exist. The following data, for example, are from a study conducted at experiment stations in the Northern Great Plains during the years 1906-1935 and the data refer to yields per acre of spring wheat:

Eight high yielding stations. $\bar{X}=16.9$ $\sigma=10.8$ $V=64$

Five low yielding stations. $\bar{X}=11.9$ $\sigma=8.9$ $V=75$

See John S. Cole, *Correlations Between Annual Precipitation and the Yield of Spring Wheat in the Great Plains*, Washington USDA Technical Bulletin 636 (1938), pp. 26-28.

It should be noted that the above is one of the causes of adverse selectivity cited which could be avoided by the establishment of an individual premium rate for each farm. The establishment of individual premium rates has been found "impractical," however, because of inaccuracies in individual farm yield data and because of the changes which have occurred in the normal level of individual farm yields. Cf. (above) footnote 7.

¹⁴ In the Great Plains, the ability to predict yields prior to seeding or in the spring appears to be increasing through the use of information obtained from recent investigations. See A. L. Hallsted and O. R. Mathews, *Soil Moisture and Winter Wheat with Suggestions for Abandonment*, Kansas Agricultural Experiment Station Bulletin No. 273 (1936) and Ray F. Pengra, "Crop Production in the Semi-Arid Regions and Insurable Risk," this *Journal*, XXIX (1947), 567-70. Cf. (below) footnote 21.

and (2) individual tilth condition of each individual field. The insurer might prevent an adverse selectivity from developing on the basis of the first factor by providing only a long term contract and by writing insurance for a definite number of acres each year. It would be practically impossible to prevent an adverse selectivity from developing on the basis of the second factor because under any kind of contract that might be written it would be necessary to allow a farmer freedom to insure part but not all of the various fields in his farm. The rational thing for a farmer to do would be to place insurance on those fields on which the probability of indemnity is relatively high. If all farmers have an equal opportunity to select fields in this manner, no adverse selectivity would result among farmers and premium-indemnity rates could be made to reflect such a situation, but a conclusion based on general observation is that farmers do not have an equal opportunity to make such choices. Some will have relatively poor yield prospects on some fields in particular years in comparison with yield prospects of some other farmers. The former group may choose to insure the fields on which there may be a high indemnity probability in comparison with the maximum indemnity probability of the other farmers. A larger proportion of the former group than of the latter group may enter the insurance program.

General conclusion. Thus, relaxation of each of the three assumptions first stated—and they must be relaxed in order to consider the conditions in some of the major agricultural regions of the United States—and interjection of the idea of increasing accuracy of farmers' yield expectations, leads to a situation implying adverse selectivity, a type of adverse selectivity which cannot be overcome by modifying the provisions of all-risk crop insurance. Therefore the general conclusion in respect to the all-risk type of crop insurance is that it will work in a satisfactory manner only under a system of conditions so exacting in their specifications that they will be found to rather limited extent in American agriculture. In some low-risk regions, in some areas where yield trends are not pronounced or are not influenced to a marked degree by the action of the individual farmer, and in case of some crops such as perennial fruits, the all-risk insurance may work in a satisfactory manner. But all-risk crop insurance may fail to work satisfactorily over the major part of the farming area, particularly the highest risk area, of the United States.

Area-Yield Insurance

Necessary condition. The basic empirical assumption used in developing the area-yield type of crop insurance is that the mean yield in a year in an area will reflect the physical crop conditions faced by a farmer in the area. While this assumption is not in the form of a necessary condition for the insurer, who may be indifferent in an actuarial sense whether it is fulfilled or not, it represents a condition which must be fulfilled to some degree if a farmer is to receive protection against the occurrence of adverse crop conditions. One method for determining when this condition is fulfilled in an area is to measure the degree of consistency with which each individual farmer's yields vary directly with the area yield. This degree of consistency will depend, to a considerable extent, on the boundaries established for the area and on the homogeneity of the area in production of the crop insured.¹⁵ The closer the correlation between farm and area yields, the more effective area-yield insurance will be in providing the equivalent of yield stability for a farmer in the area.¹⁶ It is not possible on an a priori basis to determine to what extent this correlation exists. Among some two hundred farm cases which have been studied, it would have been possible through the use of area-yield insurance to have reduced the average deviation of gross income on the individual farm, which was due to variations in yields, to a level varying from 20 to 40 percent of what the average deviation of gross income was in the absence of insurance.¹⁷ The average deviation of net income

¹⁵ The ideal area concept to employ in an area-yield insurance program might be that of a type-of-farming area which may be defined as an area within which a particular system of farming is dominant or within which two or more systems are interwoven into a pattern. Within any one area the same pattern of change should exist and the boundaries should be moved when there are changes in ecological factors. Cf. John D. Black, Marion Clawson, Charles R. Sayre, and Walter W. Wilcox, *Farm Management* (New York: The Macmillan Company 1947), pp. 384-86. Type-of-farming studies in which areas have been delineated have been completed and the results published in bulletin form for several states, among which are the following: Connecticut, Illinois, Indiana, Iowa, Kansas, Kentucky, Michigan, Montana, North Dakota, South Dakota, Texas, Utah, and Washington.

¹⁶ These correlations are a matter for empirical analysis. When the correlation is found to be high it may be concluded that there is a close relationship among area yields and crop conditions faced by the farmer. A low correlation does not prove that this relationship does not exist, however, because a lack of correlation might be caused by differences in a farmer's methods or practices.

¹⁷ This is a greater reduction than is possible under similar circumstances with the use of the 75 percent yield coverage under the all-risk type of crop insurance. This result was obtained using the assumption that premiums would be paid only in the years when area yield was above average. The yield data were taken from records of wheat farms in Montana, North Dakota, South Dakota, Kansas, and of cotton

could have been reduced to a greater degree. The extent to which similar results could be experienced would determine how effective area-yield insurance should be in providing the equivalent of yield stability for a farmer. The studies which have been made indicate that this range of effectiveness may be significantly greater than has been possible with all-risk crop insurance.

General analysis. In performing an actuarial test of area-yield insurance the first assumptions are: (1) that the secular trend value for yields on each farm is zero; and (2) that the average deviation of yields from the mean is the same for all farms. If these assumptions are realized, and if the necessary condition stated above is fulfilled, area-yield insurance would materially reduce or perhaps eliminate the income fluctuations of a farmer which are caused by yield variations. Net premiums paid by a farmer would equal indemnities received over a long period of time.

If the yield level changes on individual farms, any farmer would find that the change in his own yield level would have no effect on his own premium-indemnity schedule, except as his own yield affects the area average. The insurer may be indifferent therefore about the yield trend on any individual farm because all farmers in the area would participate in a common premium-indemnity schedule. This means that a farmer with increasing yields would not be penalized by the use of insurance and that a farmer with declining yields would not receive windfall gains through the use of insurance. A farmer would be able to reap the full gain from any improved farming practice which resulted in higher yields and a farmer who received low yields because of his own malpractice would not be subsidized.¹⁸

The weighted average yield experienced in an area each year

farms in Texas. Yields of tobacco farms in Virginia did not show as high a yield correlation. Lloyd Barber of the BAE, John Fulmer of the University of Virginia, and J. A. Hodges of Kansas State College helped to provide some of these data. These cases should be regarded as illustrations of what may be done rather than proof of the extent of area yield insurance applicability. Further refinement in area delineation should make possible closer correlations between farm and area yields and this should increase the effectiveness of area-yield insurance in providing the equivalent of yield stability.

¹⁸ It is extremely unlikely that farmers would ever resort to "collusive action" in an area to deliberately lower the area yield and thus obtain an indemnity (1) because to do so would lower the normal area yield and thus provide no long term gain and (2) because the leaders in the action would be the losers. Farmers who did not "go along" would obtain an equal indemnity as well as their regular crop. There would have to be 100 percent "collusion" for the leaders of such action to break even.

would be used in determining the eligibility for indemnity of all insured farmers. The statistical problem is twofold: (1) to establish the weights to use in an area in deriving the area average; and (2) to measure the yields in the various parts of the area each year in order to determine the area average for the year. Each year yields would be measured on a group of typical or "base" farms in each part of the area. These data would be combined to provide the weighted area average. If these farms were "well" selected, perhaps as few as 15 or 20 farms could be used to provide the necessary data and the results might be made to apply to 1,000 farms or more, depending on the size of the area and on the character of the agriculture in the region.

The normal area-yield would be an average of the weighted area yields experienced over a period of years modified to reflect the effect of changing costs and prices and changing farm technology. The normal yield would be the expected yield under normal weather conditions, and the normal yield would be changed from time to time so that insured yield and premium rates would reflect the changes in the level of yield probabilities. If this is done the insurer may be indifferent about the trend of yields in the area or among farmers in the area.

The statistical problem involved is that of developing the average of the weighted area yields and of developing the necessary "production functions," related to prices, costs, and technology, which would be used in modifying the base average to obtain the normal yield for the area.¹⁹ In order to prevent intermittent participation which might develop into an adverse selectivity it would be necessary to take account of cost and price expectations of farmers. Otherwise farmers might estimate area yields a year or two in advance with greater accuracy than would be inherent in a

¹⁹ The establishment of the premium-indemnity schedule may require successive approximations. Ten years for instance may be too short a period for the establishment of a base area yield. Cf. V. P. Timoshenko, "Variability in Wheat Yields and Outputs," *Wheat Studies of the Food Research Institute*, XIX (1943), 196. It should be recognized that changes in insured yields and in premium rates should also be based on factors such as changes in farming practices, in seed, and in use of fertilizer. The same method could not be applied in all-risk crop insurance (1) because an agency not directly associated with the management of an individual farm is not in position to determine yield probabilities on individual fields with the same degree of accuracy as the farmer and (2) because changing farming practices may make all computations of past performance meaningless. An individual farmer might change his mind about applying fertilizer thus changing the yield probability for the farm or field.

formula used by the insurer; and they might buy insurance heavily when yields are expected to be lower than the formula indicates and drop out of the program when they expect the area yield to go above that indicated by the formula.²⁰ If their expectations are correct and if the terms of the contract allow them to act in this way it is possible that an adverse selectivity might result.

Various devices might be used to overcome the possibilities of such an adverse selectivity. The freedom of individual farmers with respect to insurance might be restricted by charging an initial entry fee and a re-entry fee adjusted to prevent intermittent participation. Under some circumstances these fees might be refundable. A long-term contract—a three-, four-, or five-year contract for instance—with early deadlines for application and cancellation might be the only kind offered. Such action would be of an economically coercive nature, however, and perhaps could be justified only if the formula could not be refined to reflect the factors on which yield expectations for two or three years ahead are based. Thus the formula should be modified by known factors such as prices, costs, technological and ecological data which have influenced yields and which are expected to change the level of yields in the period of the insurance contract. The formula should be flexible enough to allow the insurer to reduce the normal yields when lower area yields are expected and to take the opposite course when higher yields are expected.²¹

If the second assumption listed—that the average deviation of yields from the mean is the same for all farms in an area—is

²⁰ If chief reliance is placed on a formula involving the projection of a trend it could be implied that the elasticity of expectations for yields is near unity. Actually it may be greater or less than unity and farmers may be aware of that fact. Hicks used the term "elasticity of expectations" as "The ratio of the proportional rise in expected prices (of a commodity) to the proportional rise in its current price." See J. R. Hicks, *Value and Capital* (Oxford University Press, 1939), p. 205. The term is used here in a similar sense, meaning that if a rise, or fall, in yields is expected to continue at the same rate the elasticity of expectations is unity. Cf. footnotes 14 and 21.

²¹ For an appraisal of how farmers may form their expectations in regard to yields see T. W. Schultz and O. H. Brownlee, "Two Trials to Determine Expectation Models Applicable to Agriculture," *Quarterly Journal of Economics*, LV (1942), 487-96. The insurer would be faced with the necessity of determining the production effects of changes in prices, costs, technological and ecological factors. Some margin of error could be allowed the insurer but in general the insurer would have to hold expectations for the area which are as precise as those held by farmers, if an adverse selectivity through time is to be avoided. Anything which adds to the degree of certainty in prices, such as a forward price program, would be an aid to the insurer in developing the normal yield.

replaced with the assumption that average deviations are not the same, it may be found that the farmers with relatively low yields will have a lower yield variation in bushels or pounds per acre than the farmers with relatively high yields. If this is the case, the farmers with high yields should insure for an acreage in excess of their seeded acreage in order to be completely protected, whereas farmers with relatively low yields could insure for less than their seeded acreage and still be completely protected. If it is found that the percentage variation in yields is more uniform than is the variation in terms of bushels or pounds per acre, then a reasonably equitable limit to put on the farmer's insurable acreage could be determined by setting an upper limit on the total acreage to be insured in an area and by allocating this acreage to farmers on the basis of relative production, yield times acreage, of the individual farms in the area. Such a method would allow the farmers in an area to be covered by insurance to the extent of relative output and it would prevent the insurer from offering insurance on a farm in excess of the farmer's normal insurable interest. In areas where average deviations of yields of individual farms do not differ to any marked degree, justice could be obtained by setting the limit on insurable acreage within about 90 percent to 110 percent of average seeded acreage on the farm.²²

Adaptation to several crops. A program of area-yield insurance could be applied to nearly all crops in an area by allowing a farmer to include several crops in his insurance program. For instance, a farmer could purchase 400 acres worth of insurance. This might cover his entire cropped acreage including a variety of crops. If wheat is the predominate crop in an area, the insurer may develop a schedule of premiums and indemnities based on records of wheat yields. An individual farmer who plants 100 acres of wheat, 50 acres of oats, 50 acres of barley, 50 acres of corn, 50 acres of sugar beets, and who has 50 acres of pasture and 50 acres of miscellaneous crops might insure his entire 400 acres by paying the premium required to insure a certain level of wheat yields in

²² The problem is (1) to prevent a farmer from insuring in excess of insurable interest, but (2) to allow a farmer to insure to almost the full extent of his insurable interest. In such an area a farmer with yields which are 110 percent of the area average might be allowed to insure up to 110 percent of his (base) seeded acreage, whereas a farmer whose yields were 90 percent of the area average might be allowed to insure for only 90 percent of his (base) seeded acreage. A special acreage allowance might be permitted for a high-risk farm in a low-risk area.

the area. His indemnity would depend on wheat yields in the area. His problem may be stated as follows: Will the general crop conditions which result in low yields for crops other than wheat also cause wheat yields to be low in the area? The general answer would be in the affirmative but the correlation may or may not be high. Among the small grains, for instance, a high correlation may be expected, but between wheat and corn, wheat and sugar beets, or wheat and pasture, the correlation probably would be lower. The value of this device would depend on the correlation existing between the area-yields of the crop used as a base and the yields of all crops which the farmer attempts to insure.

This example suggests two possibilities: (1) area-yield insurance might be based independently on two or more crops in an area; and (2) premiums and indemnities in an area might be based on a weighted average of the most important crops in the area.

Area yield insurance might be sold on the basis of the yields received for two or more crops in an area. In an area where acreage is divided among orchards, truck crops, dairying, and small grains, for example, the yield correlation among the crops might be so low that if insurance is based on wheat or grains alone, the indemnities received would not correspond with poor crops of fruit, vegetables, or feed.²³ In cases such as this an index of fruit yields might be calculated and area-yield insurance could be offered to fruit growers using the normal fruit yield as a base.²⁴ Likewise some index of yield might be developed for truck crops and area-yield insurance might be sold to truck farmers on the basis of this index. Area-yield insurance on the grains and feed crops grown could be offered on a similar basis. Insurance could be sold on each of several crops and a farmer could choose among them in any combination desired. The principle also could be extended to an index of yields for all of the major crops in an area and the weighted average yield

²³ It might be argued that when this condition is characteristic there is little need for crop insurance because (1) farmers' incomes would not be erratic because of yield variations, and (2) crop insurance would not improve resource utilization on the part of the firm. This argument would not hold in most cases, however, where the correlation is low but still significant.

²⁴ When yields are normal the index would stand at 100. When they are 90 percent of normal, the index would be 90. A farmer buying insurance could insure for yields of 50, 70, or 80 percent of normal, for instance. A range of premiums might be offered for insuring anywhere from 40 to 100 percent of normal. For discussion of a special problem which may be encountered in case of fruit, see Ralph R. Botts, "Development of 'Normal' Citrus Fruit Yields by Tree Ages for Use in a Yield Insurance Plan," this *Journal*, XXIII (1941), 867-72. The index for some crops such as tobacco might be on a yield-quality basis. See Wrather, *loc. cit.*

for any year could be expressed as a percentage of normal yield.²⁵ A farmer could insure for some percentage of normal yield and the insurer would calculate premiums and indemnities on the basis of yield experience in the area. A farmer would receive an indemnity whenever the index of yields is below the level for which he is insured.

Special problems. There are several specific risks such as hail or insect infestations which may affect an area at random. If the complete area were affected uniformly, the area-yield would be reduced and a farmer would be compensated accordingly for his crop loss attributable to the phenomenon. If only a portion of an area were affected or if the damage were not uniform over the area, a special problem exists. In this case, using hail as an example, the damage could be estimated and a specific indemnity would be paid for the particular loss.²⁶ The case for insect infestations and crop diseases appears more obscure because damaged areas may not be as clearly defined as is hail damage and insects or disease usually affect some crops more severely than others. Perhaps no special treatment can be developed at this stage for losses caused by insects or crop diseases.²⁷ The case for flooding is a special one which may best be handled by drawing area boundaries so that strips of land such as a slough or "bottomland," area which are most likely to flood would constitute an individual area.

²⁵ For discussion of the general problem of constructing a crop yield index for an area see E. J. Working, "Crop Yield Index Numbers," this *Journal*, XXII (1940), 701-13 and H. G. Hirsch, "Crop Yield Index Numbers," this *Journal*, XXV (1948), 583-98.

²⁶ The actuarial cost of the specific indemnity would be included in the original premium. In the case of hail, special adjusters would have to be employed to survey the damage over an area to determine whether any parts of an area should receive a special indemnity. If it was decided that they should, the case might be handled somewhat as follows. The regular area-yield indemnity, if any, could be calculated on the basis of the estimate of area-yield which would have existed in the absence of the hail storm and the indemnity for hail would be based on percent damage to the crop existing at the time of the storm.

The total indemnity may be calculated as follows:

Let

I = total indemnity,
 Y_i = insured yield,
 I_a = indemnity due from area-yield insurance, and
 h = percent hail damage.

Then $Y_i - I_a$ = balance of crop left after area-yield indemnity is calculated and

$$I = I_a + h(Y_i - I_a)$$

²⁷ This should be recognized as a case which may be settled according to the kind and extent of infestation or disease and which might be handled in a reasonably equitable manner through the use of special riders covering the specific risk involved to the extent that the risk is not covered by the regular area coverage.

General conclusion. The factors that appeared to work against the success of all-risk crop insurance will not lead to adverse selectivity within an area under area-yield insurance and will not endanger the success of the area-yield insurance program. Actuarial procedures can be adapted to prevent adverse selectivity and to enable the insurer to be indifferent, in an actuarial sense, to the facts (1) that yields trend upward on some farms and downward on others, (2) that yield deviations are not the same on all farms in an area, (3) that all farmers may not purchase insurance, and (4) that farmers may insure only part of their seeded acreage.

As long as the normal yield for an area can be determined accurately a system of yield probabilities may be developed for the area. The area yield probabilities may be used as the actuarial data and farmers can be protected against the occurrence of adverse crop conditions if areas are delineated so that there is a high positive correlation between crop conditions faced by the farmer and area yields. Where area yields are not an accurate indicator of these conditions, one of the other types of insurance may be more useful.

Parts of the United States where area-yield insurance should be most useful would appear to be regions such as the corn belt, the dry-farm and irrigated areas of the Great Plains, the Palouse Country of Washington, and other regions in which yields may vary uniformly in an area. It probably would not apply well to ranching areas or to cases in which crop yield variations are not uniform or consistent within an area.

Weather-Crop Insurance

Basic conditions. The basic assumptions for weather-crop insurance are. (1) that certain meteorological phenomena which depress crop yields can be defined and are measureable; and (2) that a schedule can be developed for a locality which will show the premium required to insure against an occurrence of these phenomena and the indemnity which will be associated with specific occurrences. The general formula for premiums and indemnities in any-locality would be constructed on the basis of an analysis of the relationship existing between certain weather phenomena and yields. Some of the weather phenomena which are known to be important in the determination of crop yields, such as rainfall and temperature, would be selected on the basis

of prior knowledge. Regression equations, based on simple or multiple correlations of yields and weather data, would be used to indicate the normal relationships and to indicate how yields might be expected to vary with variations in the phenomena selected. Insurance might be sold on the basis of calculated yield in an area, i.e. an indemnity would be paid whenever area calculated yield in any year was less than should occur with normal weather and the size of the indemnity would vary with the difference between the calculated yield and the "normal" yield.

Since the payment of indemnity to a farmer would be based on meteorological phenomena rather than on the yields of the individual farmer or of the area, the insurer would not be concerned in an actuarial sense about trends of yields, about which crops are insured, or about the consistency with which individual farmers insure. What is of significance in the analysis is the relationship existing between yields and the weather phenomena upon which indemnities are based. The value of the insurance for the farmer will depend on whether he will receive an indemnity when his yields are low because of adverse weather. Where a significantly high correlation between certain weather phenomena and yields is found, weather-crop insurance could be useful to farmers wishing to be protected against such adverse crop conditions.

The existence of high and significant correlations between crop yields and rainfall, soil moisture, and temperature has been established for several regions, particularly for the Great Plains region of the United States. Factors which might be included in a weather-crop insurance formula, therefore, are soil moisture at seeding time or preseasonal precipitation, seasonal precipitation, and growing season temperature or evaporation. The formula for calculating yields might include these three factors as variables or it might be merely a simple first degree regression equation using annual precipitation as the variable factor.²⁸

²⁸ For studies of weather-yield correlations see R. D. Bridgford and H. K. Hayes, "Correlation of Factors Affecting Yield of Hard Red Spring Wheat," *Journal of American Society of Agronomy*, XXIII (1931), 106-17; John S. Cole, *Correlations Between Annual Precipitation and the Yield of Spring Wheat in the Great Plains*; USDA Technical Bulletin 636, 1938, John S. Cole and O. R. Mathews, *Relation of the Depth to Which the Soil is Wet at Seeding Time to Yield of Spring Wheat on the Great Plains*; USDA Circular No. 563, 1940, G. W. Craddock and C. L. Forsling, *The Influence of Climate and Grazing on Spring-Fall Sheep Range in Southern Idaho*, USDA Technical Bulletin 600, 1938; Floyd E. Davis and J. E. Pallesen, "Effect of the Amount and Distribution of Rainfall and Evaporation During the Growing Season on Yields of Corn and Spring Wheat," *Journal of Agricultural Research*, LX

Test Cases. In several test cases on wheat grown in the Great Plains, use of a regression equation containing annual precipitation as the variable factor for estimating wheat yields would have made it possible for a farmer to make a greater reduction in the fluctuations in his annual net income through the use of weather-crop insurance than would have been possible through the use of all-risk crop insurance covering 75 percent of the base yield.²⁹ In one case which appears to be fairly typical a farmer using weather crop insurance would have failed to cover computed cash operating costs in only two of 28 years. If he had not used insurance he would have failed to cover computed cash operating costs in 15 out of the 28 years.³⁰ Further empirical investigation is needed to determine how typical such cases may be and to determine the extent of effectiveness for weather-crop insurance.

General conclusion. Weather-crop insurance would be adapted most easily to an area in which one or two weather factors, such as precipitation and temperature, are generally limiting and are

(1940), 1-23; A. L. Hallsted and E. H. Coles, "A Preliminary Report on the Relation Between Yield of Winter Wheat and Moisture in the Soil at Seeding Time," *ibid.*, XLI (1930), 469-73; A. L. Hallsted and O. R. Mathews, *Soil Moisture and Winter Wheat with Suggestions for Abandonment*, Kansas Agricultural Experiment Station Bulletin No. 273, 1936; J. W. Hopkins, "Weather and Wheat Yield in Western Canada, I. Influence of Rainfall and Temperature During the Growing Season on Plot Yields," *Canadian Journal of Research*, XII (1935), 306-34; Enoch W. Nelson, *The Influence of Precipitation and Grazing Upon Black Gramma Grass Range*, USDA Technical Bulletin 409, 1934; Ray F. Pengra, "Correlation Analysis of Precipitation and Crop Yield Data for the Sub-humid Areas of the Northern Great Plains," *Journal of the American Society of Agronomy*, XXXVIII (1946), 848-50; George A. Rogler and Howard J. Haas, "Range Production as Related to Soil Moisture and Precipitation on the Northern Great Plains," *ibid.*, XXXIX (1947), 378-89; V. P. Timoshenko, "Variability in Wheat Yields and Outputs," *Wheat Studies of the Food Research Institute*, XVIII (1942), 291-338 and *ibid.* XIX (1943), 151-202; L. R. Waldron "Yield and Protein Content of Hard Red Spring Wheat Under Conditions of High Temperature and Low Moisture," *Journal of Agricultural Research*, XLII (1933), 129-47; P. Patton, *The Relationship of Weather to Crops in the Plains Region of Montana*, Montana Agricultural Experiment Station Bulletin 206, 1927; H. L. Walster and P. A. Nystuen, *North Dakota Wheat Yields*, North Dakota Agricultural Experiment Station Bulletin 350, 1948. For weather and yield data, based on state averages, see Louis H. Bean, *Crop Yields and Weather*, USDA Miscellaneous Publication No. 471, 1942.

²⁹ This result was obtained using the assumption that premiums would be paid only in the years when estimated yield was above normal. Data are from John S. Cole, *op. cit.* They represent rainfall and experiment station yields for 14 stations in the Great Plains covering 272 crop years. This type of insurance could be made more effective in stabilizing income if the estimating equation is expanded to differentiate between preseasonal and seasonal precipitation and to include temperature or evaporation coefficients.

³⁰ Computed cash operating costs included cash outlays for all usual operations plus insurance premiums, normal depreciation allowances on machinery, and \$1,500 as the minimum family living allowance.

highly significant in the determination of crop yields. Semi-arid regions generally fit this description. In humid temperate areas the correlation between yields and weather factors may be less clearly defined and it may be relatively difficult to develop a reliable estimating equation for such areas. The magnitude of the coefficient of variability in yields may be less in these latter areas than in the semi-arid regions and the inaccuracies in the estimating equations would cause the errors in indemnity payments to be greater, compared with the premium level, than if the coefficient of variability of yields is large. In addition, weather-crop insurance may be of little value in case of crops where yields are strongly affected by risks such as insect infestations and certain crop diseases which may follow a year or two after a particular type of weather has been experienced.

Weather-crop insurance may be best adapted to grazing areas such as are found in semi-arid regions of the United States and under some conditions it may be useful in dry-farming areas.³¹ In such situations it may have important advantages in comparison with the other types of crop insurance. Since the actuarial basis of weather-crop insurance is weather data, actuarial tables would be unaffected by changing economic, technical or technological factors which may influence the general trend of yields. This is an advantage actuarially speaking, compared with area-yield insurance and all-risk crop insurance, because premiums would not have to be recomputed or revised when price changes or technological developments alter general yield prospects. Revisions would be made only when it became evident that the measurements of the weather phenomena had been inaccurate or unrepresentative.³² Thus once established, so that premiums and indemnities are actuarially correct, modifications in rates would be minor and infrequent.

Effects of the Actuarial Base on Resource Utilization

The use of crop insurance may have various effects on the

³¹ The term "dry-land farming" is used to typify a system of farming used in semi-arid regions of the United States where special moisture conservation practices are followed such as alternate cropping and fallowing, strip cropping, stubble mulching, and listing.

³² Ordinarily the premium-indemnity schedule would not be changed during short weather cycles, such as three- or four-year cycles, but changes would be made on basis of data covering longer periods of time. Cf. Timoshenko, *op. cit.*, XIX (1948), 294-97.

pattern and efficiency of resource utilization depending on the type of insurance used and on the relationship between yield expectations held by the farmer and his insured yield. It may be assumed, as a first approximation, that use of insurance would provide a basis for a farmer to measure the cost of the uncertainty inherent in the weather by presenting him with a specific premium-indemnity schedule. To the extent that it does this it should permit him to achieve a position of optimum resource utilization in a more consistent manner than he could achieve without insurance.³³ This first approximation must be modified, however, according to the assumptions that are made in respect to the three types of insurance.

All-risk crop insurance. The effect of all-risk crop insurance on resource utilization may depend on the relationship of a farmer's insured yield to his yield expectations in a given cost situation. Three distinct types of situations may be postulated as follows: (1) a situation in which yield expectations are normal with respect to the base yield; (2) a situation in which yield expectations are relatively poor, assumed to be about the level of insured yields; and (3) a situation in which yield expectations are very good, about 10 to 15 percent above the average yield of the base period. In each situation it is assumed that the farmer has some specific knowledge about the condition of his farm on which to base his expectations.

If yield expectations are about normal with respect to the base period, with crop insurance the farmer should be able to come closer to the point for optimum resource utilization than he could without insurance because the cost of uncertainty inherent in the weather will be defined and will be given an average value through payment of the premium. A fixed cost, the premium, will be substituted for an uncertain cost, the cost of yield variability.

If yield expectations are relatively poor, approximately at the level of the insured yield, for example, a pronounced change may take place in the plans for the firm. In this case the farmer may

³³ If certain unpaid costs which may arise through erosion, free public service, or family exploitation are neglected, and if the existing pattern of resource control or ownership is accepted as given, an optimum utilization of resources may be defined as a condition that exists when any small change in the production pattern leads to a combination of decrements and increments in output such that there is no system of exchanges whereby the increments will be accepted voluntarily as a compensation for the decrements.

restrict inputs to the level which is necessary to qualify for crop insurance.³⁴ By doing so he may eliminate any possibility of loss and in case weather conditions are more favorable than is normal a net return may be realized. The farmer would cover his costs if the yield is as expected. He would have a net gain equal to the harvesting expense if there is a complete crop failure and he would have a net return for management if weather conditions are more favorable than is normal. A farmer might prefer, therefore, that the crop would be a complete failure or that weather conditions would be unusually good.³⁵ In general the closer the expected yield approaches insured yield (from above), the greater would be the tendency to reduce inputs to the level necessary to qualify for crop insurance; and when expected yield is less than insured yield this tendency would be at a maximum.³⁶ If contracts are written containing the provisions which have been described—that the discounted value of the maximum insurance indemnity is equal to or greater than the cost of the qualifying inputs—crop prospects could not become bad enough to discourage seeding.

³⁴ The condition attached to the analysis is that the farmer must employ some minimum inputs in order to qualify for insurance. It is assumed that the cost of these inputs, plus cost of harvesting a relatively poor crop, plus the insurance premium, are equal to the maximum insurance indemnity.

³⁵ In some earlier years of the Federal crop insurance program a delay in the completion of contracts allowed some farmers to continue to plant and insure when crop failure was almost certain. See Clendenin, *op. cit.*, p. 250.

³⁶ This may help to explain why Congress, in an attempt to avoid losses which would be inherent in over-insuring, recently found it expedient to apply new restrictions on insured levels. The 1947 amendment to the Federal Crop Insurance Act read in part "... if 75 per centum of the average yield (on the insured farm) represents generally more protection than the investment in the crop in any area, taking into consideration recognized farming practices, the Board shall reduce such maximum percentage so as more nearly to reflect the investment in the crop in such area . . ." See 80th Congress, 1st Session, *Public Law 320* (S. 1926), p. 1, Sec. 508(a). The same provision was included in the crop insurance bill introduced in the Senate in 1949. Cf. 81st Congress, 1st Session, S. 898. For a discussion of the reasons for this amendment see 80th Congress, 1st Session, *Department of Agriculture Appropriation Bill for 1948, Hearings before the Subcommittee of the Committee on Appropriations, House of Representatives* (April 19, 1947), pp. 1696-1700. Insurance may be written to cover an average investment in the crop rather than a certain percentage of average yield. This type of insurance has been used on an experimental basis for corn and tobacco. See *Report of the Manager of the Federal Crop Insurance Corporation*, 1947, pp. 25, 30. This type of insurance has been sold on a lower coverage basis than the yield type because prices constitute an additional hazard. In 1947 the FCIC was limiting coverage on tobacco to 75 per cent of the average investment, or to about two-thirds of the coverage which could be secured through the yield type. By 1947 about 15 percent of the insured tobacco producers had selected the investment type of insurance. In the case of corn the coverage was equal to about one-half to two-thirds of the coverage provided by yield insurance on basis of 75 percent coverage of average yield.

If yield expectations are very good, 10 to 15 percent above average yields, crop insurance might not be used because of the reduced probability of receiving an indemnity. If crop insurance is used in such a setting, the pattern of resource utilization would be the same as when insurance is not used. With yield expectations normal or above, no distortion in resource utilization should occur.

Area-yield insurance. The effects of area-yield insurance on resource utilization would depend on the provisions of the contract as well as on the situation existing in respect to yield expectations. With yield expectations normal or above on the individual farm it can be demonstrated that inputs would be closer to the point of optimum resource utilization than they would be if insurance is not available. This is due to the fact that the reduction in yield uncertainty should minimize some of the limiting effects of capital rationing and should eliminate the necessity for attempts which may be made without insurance to minimize loss probabilities. With yield expectations relatively low, but not so low as to discourage seeding individual fields, a similar result may be expected. If yield expectations are so poor on the individual field that seeding does not appear to be profitable, the situation resulting would depend on the provisions of the insurance contract. If the insurance contract provides that the farmer must seed a certain acreage in order to qualify for crop insurance, this provision might force a farmer to seed some fields which he otherwise might handle in a different manner. If no such provision is in the contract, resource utilization would be determined by the crop prospect. If an objective of efficient resource utilization is held, therefore, no minimum seeded acreage on a particular farm, or perhaps only a rather small minimum acreage on a farm should be established as a condition for participation in insurance.³⁷

Weather-crop insurance. The effect of weather-crop insurance on resource utilization should be in the direction of an optimum resource utilization. The reason for this is that a farmer should find it most profitable to act in accordance with the yield probabilities existing at any particular time and yet he could arrange the capital

³⁷ The insurance carrier might be required to state that some minimum acreage should be seeded in an area as a condition for insurance participation in order to establish a base for indemnity payments. An alternative method for handling conditions which are so adverse that no crop is seeded would be to shift the base for indemnities from area-yield to weather, providing the actuarial data are available and comparable.

structure of the firm with greater certainty in regard to the income prospect because the income fluctuations caused by yield variations should be reduced or eliminated. At the same time the cost of the climatic hazard would be measured in terms of a specific premium schedule.

General Conclusions

Areas of Adaptation. The advantages and disadvantages of the three types of crop insurance are relative to the empirical situations confronted. In some low risk regions where the probability of indemnity does not change from year to year and in case of some crops where the current yield is not influenced greatly by a farmer's immediate action, all-risk crop insurance may be used without adverse selectivity or without adverse effects on the efficiency of resource utilization. The same type of insurance may be found less well adapted in other regions or among crops where the necessary conditions are not fulfilled. It may be inadequate and actuarially unworkable in a high risk region like the Great Plains. In such a region area-yield insurance and weather-crop insurance, according to the theory developed, should prove more satisfactory (1) because of the possibilities of providing a higher base for insured yields, (2) because the insurance programs can be made equitable in an actuarial sense and an adverse selectivity can be avoided, and (3) because both types should have a positive, rather than a negative, effect on the efficiency of resource utilization.

Suggested program. If these conclusions are correct the program for crop insurance in the United States should develop somewhat as follows: (1) Since all-risk crop insurance may be appropriate chiefly in low risk regions, or in regions where the first assumptions mentioned above are fulfilled, its use should be confined to such regions or situations. Empirical studies should be continued to determine the premium-indemnity schedules and the provisions which would be most appropriate for such regions or crops. (2) Since area-yield insurance may be most appropriate for the high risk crop regions such as the Great Plains, parts of the corn belt, the western cotton area, etc., empirical studies should be undertaken as a basis for instituting the program. These would involve the delineation of areas and the calculation of premium-indemnity schedules for each area.³⁸ (3) Since weather-yield insurance may be the only type

³⁸ Since 1947 an amendment to the Federal Crop Insurance Act has provided that the FCIC might insure or reinsure "... producers of agricultural commodities

appropriate for large areas of the western United States, especially the ranching areas, investigations should be continued as a basis for determining the specific relationship between weather phenomena, particularly precipitation, and range or forage yields. The weather phenomena then could be used as a basis for writing insurance on range or forage production.

In viewing the record of crop insurance in the United States most writers have counseled caution and have indicated that it may take years to develop a reasonably satisfactory program. For instance, the wheat crop insurance consulting committee appointed by the Board of Directors of the FCIC concluded in a report submitted in 1942 "... that the opportunity be afforded to accumulate the fullest data possible before the crop insurance program is ... extended."³⁹ Clendenin stated in 1942 that the goal of crop insurance is "eminently desirable, does not seem improbable of attainment, and justifies experiment with the single crop [wheat, *i.e.*, be restricted to wheat] until the attempt is either successful or proved definitely unlikely to succeed."⁴⁰ In 1947, the record of crop insurance was reviewed in detail in Congress, both on the floor of the House and Senate⁴¹ and before the House and Senate committees on agriculture.⁴² The House Agricultural Committee, in its report to accompany an amendment to the crop insurance act stated "... the committee believes it should be recognized that the development of a sound crop-insurance program covering even the major agricultural commodities on a nation-wide basis is a long-

under any plan or plans of insurance determined by the Board to be adapted to any such commodity ... for the purpose of determining the most practical plan, terms, and conditions of insurance ... " But the regular programs have been administered under the restrictions (1) that "... any insurance offered against loss in yield shall not cover in excess of 75 per centum of the recorded or appraised average yield of the commodity on the insured farm ..." and (2) that insurance shall not exceed the investment in the crop. See 80th Congress, 1st Session, *Public Law 320*, *loc. cit.* and 81st Congress, 1st Session, S. 898 These latter provisions in the law would have to be amended to permit the development of area-yield insurance or weather-crop insurance on a commercial basis.

³⁹ Herman L. Ekern, Robert J. Laubengayer, and Wilham G. Cochran, *Summary of Report of the Wheat Crop Consulting Committee on the Operations of the Federal Crop Insurance Corporation* (1942), p. 42

⁴⁰ J. C. Clendenin, *op. cit.*, p. 274.

⁴¹ See 80th Congress, 1st Session, *Congressional Record*, XCIII (March 31, July 3, July 9, July 25, and July 26, 1947), 3012-3015, 8440-8441, 8698-8699, 10296-10302, 10580-10581.

⁴² See 80th Congress, First Session, *Crop Insurance, Hearings before the Committee on Agriculture, House of Representatives* (March 20 and 21, 1947) and *Federal Crop Insurance, Hearings before the Committee on Agriculture and Forestry, United States Senate on S. 1326* (June 30, 1947).

time project that may well take years in its accomplishment. . . . The committee is convinced . . . that the best interests of farmers themselves will be most truly served if the Public Treasury is protected against excessive loss, by curtailment of the insurance program during its development period to the smallest scale consistent with effective experimentation, and expanding it later only when experience has indicated that a sound insurance plan has been worked out. . . . ”⁴³

While the above statements are well founded in terms of general experience, the conclusion seems inescapable that the chief reason for failures is that programs have been based on a faulty conception of the actuarial problems involved. If the most appropriate structure for actuarial purposes is used, crop insurance programs might be developed on a nation-wide scale more rapidly than has been usually indicated. This would involve (1) placing greater emphasis on determining the most suitable actuarial base for the particular region and crop, (2) marshalling the data necessary for use with this base, and (3) developing the administrative organizations and techniques which may be most appropriate.

⁴³ See *Report of the Manager of the Federal Crop Insurance Corporation*, 1947, p. 4.

THE FIELD OF AGRICULTURAL MARKETING RESEARCH: OBJECTIVES, DEFINITION, CONTENT, CRITERIA

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THE OBJECTIVES, definition, content, and criteria for the field of agricultural marketing are all related. Let us see if we can set them down, separately, but in proper relation to one another.

Objectives of Agricultural Marketing Research

What is the over-all objective of research in agricultural marketing?

Some believe that the over-all objective is to increase the consumption of farm products.¹ Many believe that the objective is to maximize farmers' net returns.² Title II of the Research and Marketing Act of 1946 declares that "a sound, efficient, and privately operated system for distributing and marketing agricultural products is essential to a prosperous agriculture and is indispensable to the maintenance of full employment and to the welfare, prosperity, and health of the Nation." This apparently is the legislators' objective in providing for marketing research. Economists are likely to hold the view that the objective of marketing research is merely a part of the general economic objective of allocating scarce resources so as to maximize the output of goods and services.³ Others may have still other goals.

Let us consider these different over-all objectives in turn.

Increasing the consumption of farm products is an acceptable objective, from a national point of view, only if nutritional and clothing needs are not already being met. If nutritional and clothing needs are being met, it is difficult to see, from a national point of view, why there is any more intrinsic merit in increasing the consumption of farm products than in increasing the consumption of other products.

To take a concrete case: Nutritional studies show that all income

¹ This objective, for example, was written into the basic project statement of the North Central Regional committee on dairy marketing research in 1947.

² "Report of the New York Milkshed Price Committee," Feb. 1949, p. 5.

³ This objective is stressed by R. G. Bressler in his article, "Agricultural Marketing Research" this *Journal*, XXXI, No. 1, Part 2, Feb. 1949, pp. 553-562.

groups consume substantially less milk than they need for adequate nutrition.⁴ Research directed toward expanding the consumption of milk therefore would benefit the nation as a whole. Nutritional studies also show that all income groups consume substantially more butter and other fats than they need, nutritionally. Research directed toward expanding the consumption of butter and other fats could not well be justified on the same grounds as for milk.

Maximizing farmers' net returns. This objective is implicit if not explicit in much agricultural marketing research.

So far as farmers' net returns can be maximized by reducing marketing costs, the nation would benefit as well as the farmers concerned. But net returns also can be maximized by monopolistic action to raise prices. Such monopolistic action would be inimical to national welfare, and farmers object to it when it is practiced by other groups. It can hardly be included uncritically as a legitimate objective for agricultural marketing research.

A similar objective is sometimes expressed in different words—to *increase farm incomes*. Before that objective could be accepted, the case would have to be made that farmers' incomes needed increasing more than other peoples' incomes.⁵ This case is relatively easy to establish during depression, when farm incomes decline more than the incomes of most other groups. It is less easy to establish during booms, when farm incomes rise more than the incomes of most other groups.⁶ In any case, the particular method of raising farm incomes by marketing research would have to be examined. The citrus growers over the past few decades have done a remarkably good job of marketing their product, and research may have been a big factor in getting the job done. Yet the prices of citrus fruits stand now at almost the lowest percentage of parity on the whole list of farm products—11 percent in March 1948, and even after the big freeze last Fall, only 31 percent in March 1949. Good marketing alone was not able to ensure high farm income.⁷

⁴ Willard W. Cochrane, *High-Level Food Consumption in the United States*, BAE, USDA, Misc. Pub. No. 581, December 1945, p. 10.

⁵ The arguments on this point go on and on. For the most recent discussion, see Carl Kaysen and James H. Lorie, "A note on Professor Schultz's Analysis of the Long Run Agricultural Problem," *Review of Economics and Statistics* XXX: 286-295, Nov. 1948. Schultz, T. W. "A comment," this *Journal* XXX: 295-296 Nov. 1948. Carl Kaysen and James H. Lorie. "A rejoinder," this *Journal* XXX: 296-297, Nov. 1948.

⁶ 1949 *Agricultural Outlook Charts*, USDA, BAE, Washington, D. C., Oct. 1948, p. 7.

⁷ This paragraph barely scratches the surface of the whole problem whether net

The suggestion has been made in some quarters that agricultural economists should seek to increase farm income in any case—because “the farmer’s the fellow you’re working for”—regardless of the national welfare.

This is clearly a misconception. An agricultural economist on the payroll of a farm commodity pressure group or general farm organization may have that limited objective, but his views would require examination to make sure they were not biased by his connections. The agricultural economist at a college or university is in a different situation. He is a scientist. He is not “working for the farmer” or any other special group. He is working for everybody, seeking for objective impartial truth, just as an atomic research man is not working for the aluminum interests or the uranium interests, but for society as a whole.

It seems clear that the over-all objective of research in agricultural marketing, at any scientific institution worthy of the name, must be in line with the objectives of all scientific institutions—the maximum satisfaction of consumers’ demands—through the maintenance or development of pricing systems that accurately reflect those demands and allocate resources to their maximum satisfaction, and through the reduction of marketing costs.

Scope of the Field

The field of agricultural marketing can be defined either narrowly or broadly.

A narrow definition of the field is frequently used. It restricts the field of marketing to the job of getting the product from the harvest field to the consumer’s table. This appears to be the definition adopted in the Research and Marketing Act of 1946, although no explicit definition as such is given in the Act.

This narrower definition is suited to the purposes of the Act, which are to direct research into a part of the field that previously has been neglected. But it does not provide adequate coverage of the field as a whole. Put in everyday language, the narrower definition reflects this view: “Here’s the stuff. We’ve produced it; now you sell it as best you can. And see if you can’t develop some new uses for it, to help us get rid of it.”

farm income per capita can be raised without the aid of additional measures to facilitate the movement of the half million a year of young farmers growing up in excess of the number needed in agriculture. I have attempted to deal with this problem in Chapters 29 and 30 of my *Agricultural Price Policy*.

The shortcomings of this view are evident. Many marketing problems arise because the right variety of crop was not planted in the first place. Many other marketing problems arise because the right quantity was not produced. To begin with the harvested crop on the ground is to begin too late, after much of the marketing problem is already past solution.

In order to deal with marketing problems adequately, therefore, we need to define the field broadly enough to encompass all the forces that create the problems. We need to include studies of consumer demand (its relation to income, its elasticity, changes, etc.) price policies, and so forth.³

Which End of the Field to Start With?

We also need to look at the field of agricultural marketing from the proper end.

That is to say, we should not start with what farmers have produced; we should start with what consumers want. We need to start with consumers' demands for food and clothing, and see how well producers can meet them. Production without regard to consumers' wants obviously is poor business for producers as well as for consumers and the nation as a whole. Adam Smith may be out of date on some things, but he was correct and still is correct in his observation that consumption is the aim and end of all production. Any producer who does not start with what the market wants and then try to produce it is asking to go broke.

If we were living in a purely competitive economic environment, consumers' demands would be a sufficient starting point. But our environment is not economic only; we live in a partly welfare state, as well as an economic one. We take into account consumers' *needs*, as well as their *demands*. Some groups at some times do not earn enough to back up their demand for food and clothing with purchasing power (in the economic sense, of course, demand does

³ I believe that this is substantially the same thing that L. J. Norton had in mind when he outlined as the first problem in marketing research, *The Market*. . . . "This term is used to mean the quantitative and price aspects of an economy's sales of a particular good." Norton then defined the first subdivision of this problem as "price-quantity relationships, income effects, distribution-of-income effects, general price level effect, competitive relationships, secular tendencies in relative demands, etc." (this *Journal*, XXXI . 1, May, 1949, pp. 350-351).

Norton's article was drawn to my attention by the Editor of this *Journal* after I sent my manuscript in to him. It appears to me that we have arrived independently at much the same conclusion, that the field of marketing needs to be defined broadly to include the study of consumer demand.

not exist unless it is backed up by purchasing power). When this happens, we do not let those people starve and freeze. In one way or another, we give them purchasing power to buy enough food and clothing to provide for their minimum needs. The determination of these needs is a job for nutritionists and others in the sciences involved; but figuring out how to provide for those needs, and estimating how much this provision will add to the total demand, surely is part of the field of agricultural marketing research.

Extent of the Field

We may agree that we should begin with consumer demand. But that is only a beginning.

Where we go from there, to define the field of marketing, can be shown best by a diagram such as Figure 1.

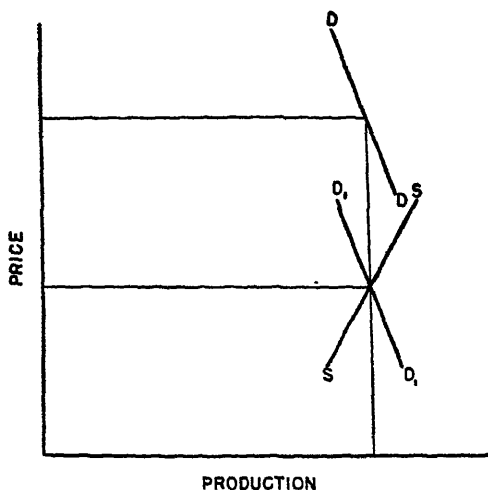


FIG 1

The upper negatively sloping curve DD represents consumer demand for farm products at retail. It has an elasticity of -0.4 , the figure estimated by Cochrane.⁹ The lower sloping line D_1D_1 represents the demand curve for farm products at the farm. It lies below the upper curve DD by the amount of the marketing costs.

⁹ Willard W Cochrane, *Farm Price Gyration—An Aggregative Hypothesis*, this *Journal*, XXIX, No. 2, May, 1947.

The long-run supply curve for farm products is represented by the positively sloping¹⁰ line SS. It intersects the demand curve for farm products at the farm, D_1D_1 . The vertical line above the point of intersection cuts the demand curve for farm products at retail.

In terms of this diagram, the field of marketing may be defined as everything above the line D_1D_1 .

In similar terms, everything below the line SS is farm management or production.¹¹

Content of the Field

As defined above, the field of agricultural marketing includes three major parts.

The first part deals with the position, elasticity, curvature, etc., of the demand curve for farm products at retail, the relation of the curve to consumer income, and so forth. It includes such questions as whether attempts should be made to shift the curve up or down, or to keep it from shifting up or down.

The second part of the field of agricultural marketing deals with prices. Consumers' demands are the guides to producers as they lay their production and marketing plans, and one of the best media for transmitting these demands to producers is the system of prices. The accuracy and clarity of prices as lenses refracting consumer demands therefore is an essential area of study in the field of agricultural marketing. Private and public agricultural price policy are both included here.

The field of agricultural marketing obviously also includes the area of costs and profits lying between the two sloping curves. The field is sketched above in terms of farm products as a group; it includes also the different products taken separately, and relations among the different products.

The three major parts of the field of agricultural marketing can thus be described in summary terms.

¹⁰ There is evidence that the short-run supply curve for farm products is practically vertical. The supply curves for individual farm products are more elastic. (Cochrane, *op cit.*)

¹¹ A question may be raised. What about the area to the right of the intersection of D_1D_1 and SS, above D_1D_1 and below SS? Is it marketing, or production?

The answer is that really there is no such area. The demand and supply curves do not intersect, strictly speaking. They lie on different planes, the one representing the responses of consumers, and the other representing (with appropriate lags) the responses of producers.

1. Consumer demand for farm products—elasticity, and changes.
2. The prices that refract these demands more or less perfectly to producers.
3. The costs of marketing intervening between producers and consumers.

Specific Objectives

At the end of the first section of this paper, after the general objective of agricultural marketing research was set forth, the statement was made that the specific objectives could best be drawn up after the scope and content of the field was outlined. We are now in a position to draw up these specific objectives.

The belief is often expressed that the objective of agricultural marketing research is to reduce the costs of marketing. Farm management research, for example, can promote the maximum satisfaction of consumers' demands if its objective is to reduce the costs of production. Similarly, marketing research can promote the maximum satisfaction of consumers' demands if its objective is to reduce the costs of marketing.

Reducing the costs of marketing clearly is one major and essential objective in marketing research. But it is not the only one; it is in fact only the third of three related objectives under the general objective of maximum satisfaction of consumers' wants.

In the light of the three parts of the field shown above, the first objective clearly is to determine consumers' demands. The second objective then is to ensure that the marketing system accurately reflects those demands clear back to the producer, so that he can produce accordingly. Reducing the cost of getting those goods to the consumer then is the third of the three related objectives.

Let us examine these specific objectives a little more fully.

To determine consumer demands:

The study of consumer demands falls naturally into two parts, one dealing with the demand for existing products, and the other with the potential demand for new products.

The consumer demand for existing products is objectively represented in retail prices and quantities sold. The job in this case is to get the data, analyse them, and see what they mean in terms of relative costs. The quantities of a particular grade or package that can be sold at price differentials sufficient to cover the cost differ-

entials for packaging, or of producing the product in the first place, may be too small to warrant selling that grade; or they may be so large as to warrant increased production of it.

The potential demand for new products is more difficult to measure.

In some cases the "new" product may be a familiar one, already on the market, the "newness" consisting only of its being made from farm products. An illustration of this is the manufacture of industrial alcohol from domestic farm products, where previously it has been made chiefly from molasses (mostly imported) and derivatives of petroleum. The job here is to estimate the costs of the new source, or of the new process, and see how it stacks up in the competition with existing processes and products.

In other cases, the new product may be really new, or at least not generally familiar. Avocado pears used to be a good example of this. Sweet corn, husked and wrapped in cellophane, is a more recent example of a new package (rather than product). In these cases, a controlled experiment, based on sales at different prices in a regular retail store is a good way to measure the consumer demand.

To ensure that the marketing system accurately reflects consumer demands:

The second objective is to ensure that the marketing system accurately reflects consumer wants. In war time, consumer needs are given greater recognition than in peace time, and a whole complex system of government rationing and price controls is usually employed to do the job. This method was continued for some time after the war in many European countries. But in the United States we got back to open market prices as reflectors of consumer demands as quickly as we could.

In peacetime, at least in the United States, this second objective is primarily a market price objective. The criterion or standard of reference here is the concept of the perfect market. This is analogous to the physicists' perfect vacuum, or frictionless motion—never attainable in actual life, but nevertheless an essential standard of reference.

The distinguishing feature of a perfect market is that a uniform price prevails, with proper allowances for differences in place, time and form. Most markets (groups of traders) are scattered

over a considerable area of space. The "uniform" price in a perfect market therefore is uniform plus or minus transportation and handling charges from one geographical point to another. This traditional criterion of uniformity in *space* is supplemented by a corresponding criterion of uniformity in *time*, plus or minus storage and handling costs from one period of time to another while basic supply and demand remain unchanged. Finally, a third criterion of market perfection is the uniformity of prices for different grades of a product—that is, uniformity in *form*, plus or minus conversion (processing) or production costs from or between different grades. These three criteria correspond with the orthodox division of utilities, in economic theory, into space, time, and form utilities.

In a perfect market, therefore, prices at any one time are uniform over geographical areas, plus or minus the cost of getting supplies from surplus to deficit areas. The price of fresh pork loins, for example, in New York City would be the same as the price in Chicago plus transportation and handling charges from the one city to the other.

Prices in a perfect market also would be uniform at any one point over periods of time, plus or minus the costs of storing from one period to another (or the costs of producing at different times). The price of cotton would rise after harvest by an amount equal to the costs of storage.

Finally, the prices for different grades of a product in a perfect market at any one point of time would be uniform plus or minus the costs of converting the product from one grade or form to another, or the relative costs of producing the different grades. The price of choice steers would exceed the price of good steers by the difference between the costs of producing the one and the other.

The three-fold criterion of the perfect market can be summarized in brief tabular form as shown in Table I on page 453.

This criterion, the perfect market, in which differences in prices equal differences in costs, is merely a specialized part of the criterion that is generally accepted for the whole field of economics—the equivalence of marginal revenues to marginal costs. This maximizes production from a given set of resources. In a perfectly competitive market (with horizontal demand curves for the products of individual producers) the equivalence of marginal revenues and costs leads to an equivalence of average revenues and costs.

TABLE I. FUNDAMENTAL ELEMENTS OF THE CRITERION OF THE PERFECT MARKET

	Time	Place	Form
(1) Prices	Price movements over long, medium and short periods of time.	Price differentials between different places.	Price differentials between different grades.
(2) Costs	a. Costs of production at different times and b. Costs of storage from one time to another.	a. Costs of production in different places and b. Costs of transportation from one place to another.	a. Costs of production of different grades and b. Costs of processing the same product into different grades.

This concept of the perfect market is useful also as a framework for classifying marketing research projects and organizing the content of marketing books,¹² as well as for appraising individual marketing problems.¹³

Max Brunk, however, disputes the usefulness of the concept, in the following words:

"... for a number of years now, marketing researchers have been obtaining facts based on well formulated hypotheses which serve to modify some of the basic assumptions behind the ideal market concept. If we must continue to ignore these modifications and return to a static ideal market concept for a framework within which to fit our studies, evaluate past work and plan future work, we can hope to make little progress. This does not deny the importance of competitive economic theory in the formulation and constant improvement of basic concepts, but it does seem to censure researchers for not having used theory in the development of concept modifications in the light of facts which have been thus far developed. Science progresses only to the extent that new hypotheses are developed from the testing of old hypotheses. We cannot expect to make much progress by continually basing our research on concepts which fail to grow. Needless to say, our marketing system today bears little semblance to that envisioned by classical economists."¹⁴

Bressler evidently anticipated criticism on the point, in the full paragraph on page 555 of his article. Apparently, however, this did not satisfy his first discussant.

Brunk makes one constructive suggestion. He says: "As for the need of a benchmark by which to measure accomplishment, it appears to me that the existing market supplies a more meaningful

¹² See Chapter 3 of my original *Agricultural Price Analysis*, Iowa State College Press, 1941, and the table of contents of my *Marketing Farm Products*, 1947.

¹³ R. G. Bressler uses it well for both purposes in his *Agricultural Marketing Research*, this *Journal*, XXXI, No. 1, Part 2, Feb., 1949, pp. 553-562.

¹⁴ Max E. Brunk, *Discussion* (of Bressler's paper), this *Journal*, XXXI, No. 1, Part 2, Feb., 1949, p. 563.

base. Such a base, of course, fails to indice maximum possible achievement."¹⁵

Brunk's point needs discussion. How does "the existing market" supply any kind of a base, still less "a more meaningful base," than the ideal or perfect market? How can you tell by looking at the existing market whether any improvement in its prices is desirable or can be made? How do you know what "improvement" is? In which direction, if any, should prices be changed? And how can you tell whether they would be any "better" than before? What does "better" mean?

To be specific, how would you know whether the existing short-time variations in futures market prices were wider or more frequent than necessary? What is necessary? How would you know whether price differentials between Chicago and New York were too wide or too narrow?

Yet I am not disposed to throw Brunk's criticism out entirely. I may well be that in some cases the open competitive market is an obsolete criterion of market performance. In some cases, the economies of scale may be so great that one large corporation can make or market a product at lower cost than a large number of atomistically competing small units, even though the large corporation exercises some monopoly powers. I would merely say that each situation needs to be examined with reference to this point and the appropriate criterion used for each case.

To reduce marketing costs:

Costs also fall under the three heads of place, time and form. There are costs of transportation from one *place* to another, costs of storage from one *time* to another, and costs of conversion from one *form* to another. These costs are the bases for the place, time and form differentials in prices discussed above.

These costs are involved at various points along the distributive system. Thomsen urges that more attention be given to the costs at the retail end of the chain, for those costs take the largest share of the consumer's dollar.¹⁶ I think that probably he is right in this point. The size of the part of the consumer's dollar that goes to a specific function establishes a presumption that research in that

¹⁵ Max E. Brunk, *Discussion*, this *Journal*, XXXI, No. 1, Part 2, Feb. 1949, p. 562.

¹⁶ F. L. Thomsen, *A Critical Examination of Marketing Research*, this *Journal*, XXVII: 4, Nov. 1945, pp. 947-902.

area will yield greater results than research where there is less room for reductions to be made. But the size of the share of the consumer's dollar is not a sufficient criterion alone for determining the place where research projects are most likely to be fruitful. A prospector strikes it rich, not by working the biggest mountain, where traces of gold may be scattered all about, but by working the mountain, regardless of size, where gold is concentrated in veins. A marketing research project may be able to show how a 20 percent reduction can be made in a small-cost function, more easily than a two percent reduction in a large-cost function, and thus end up with a greater reduction in cents. And that is what counts.

Determining where the veins are is as difficult for a research man as for a prospector, and perhaps luck is as much involved in the one case as in the other. The development of criteria for choosing profitable areas for research stands as a challenge to research men and administrators both; we need to work out scientific objective methods analogous to the geophysical methods that have raised petroleum prospecting from a wildcatting proposition to a more scientific level.

LAND REFORM AND THE TRANSFORMATION OF AGRICULTURE IN HUNGARY

ALEXANDER ECKSTEIN*

HUNGARY remained one of the last strongholds of feudal or semi-feudal forms of tenure in Europe up to 1945. Less than one percent of the farm-holders owned almost half of the agricultural land. Close to one-third of the agricultural land was in holdings of over 1,000 cadastral yokes (approximately 575 hectares).¹

A powerful landed aristocracy based on large latifundia survived the defeat of World War I and the consequent wave of agrarian upheavals sweeping Eastern Europe. It took another defeat in World War II and a revolution to bring about a subdivision of these large estates, through a series of measures known as the "land reform."

Peculiarities of the country's historical, political, and economic development tended to keep feudalism dominant longer than in other parts of Europe. The resulting continuing inequities in land distribution aggravated the effects of acute population pressure upon arable land resources in a highly specialized and extensive type of agriculture.

The combined momentum of a landless agricultural proletariat, a poverty-stricken peasantry, and an underdeveloped agricultural economy resulted in a situation where some form of change became inevitable. When it came, the change involved not only a redirection of land policy but also significant transformations in the country's agriculture. These transformations and their effect upon farm organization, agricultural labor and employment are analyzed in this paper

Land Reform of the 'Twenties

The basic land tenure pattern in Hungary was fairly definitely fixed by the time of the peasant liberation of 1848. Even after the peasants acquired ownership of the lands on which they worked, a large proportion of the country's agricultural area remained in

* On leave from FAO; currently a fellow of the Social Science Research Council. The opinions expressed do not necessarily reflect the views of either of these organizations.

¹ Kerek, Michael; Agricultural Land Reform in Hungary, *Hungarian Quarterly*, Vol. 6, No. 3, 1940.

estates of over 1,000 cadastral yokes.² The agricultural economy continued to be characterized by a very large number of small farms and a comparatively small number of large estates.

As time went on the situation of the small peasantry deteriorated. Prevailing inheritance practices led to fragmentation of holdings, and overseas grain price competition forced many peasants into heavy debt. A considerable number lost their holdings and joined the ranks of those who even in 1848 were left landless. The potent land hunger of this agricultural proletariat furnished the strongest pressure for post World War I reform.

The short-lived revolutionary regimes of 1918 and 1919 initiated steps to solve the land problem. These beginnings could not be ignored even by the victorious government. Some measure of land redistribution was instituted, both to satisfy the pressing demand of the peasantry and to subdue its revolutionary force.

Altogether about one million cadastral yokes were appropriated by the State, representing about six percent of the total area in farms, and a higher proportion of cultivated land. Out of this total, slightly over 705 thousand cadastral yokes were distributed to almost 390 thousand individuals.³ The average parcel was 1.8 cadastral yokes (2.56 acres).

The maximum allotment that could be obtained by the landless workers—the largest category of claimants—was three cadastral yokes. As a result, a very large number of uneconomical dwarf holdings were created. About 185 thousand landless farm workers and 113 thousand dwarf and small holders were the principal beneficiaries of reform. Besides obtaining land, they derived indirect benefits through the enlargement of community pastures by about 80 thousand cadastral yokes.

By 1931 redistribution of land was just about completed, so results of the 1935 Census returns can be taken as indicative of the effect of the reform.

The most striking feature of this table is that 306 holdings encompassed 11.8 percent of the land area, while over 664 thousand holdings embraced only ten percent of the land. Less than one-tenth of one percent of the landowners, with holdings of over 1,000

² No statistics of land distribution are available for this period, but it has been estimated that over one-third of the land was in estates of over 1,000 cadastral yokes.

³ *Les Conditions de la Propriété Foncière en Hongrie dans l'année 1935* Published by the Royal Hungarian Central Bureau of Statistics, Budapest 1936, p. 15.

TABLE I. SIZE DISTRIBUTION OF FARMS IN HUNGARY IN 1935

Size class in cad yokes	Number in each size class		Area in each size class	
	No of farms	Percent of total number	Area in cad yokes	Percent of total area
0-1	776,487	41.0	312,403	1.9
1-5	664,268	35.1	1,620,942	10.1
5-10	204,471	10.8	1,477,376	9.2
10-20	144,186	7.6	2,025,946	12.6
20-50	78,668	3.9	2,172,300	13.5
50-100	14,895	0.8	1,008,597	6.3
100-500	10,669	0.6	2,251,629	14.0
500-1,000	1,816	0.1	1,274,054	7.9
1,000-3,000	1,254	0.1	2,053,766	12.7
Over 3,000	306	Neg.	1,908,328	11.8
	1,892,010	100.0	16,105,341	100.0

Source: *Les Conditions de la Propriété Foncière en Hongrie dans l'année 1935*. Published by the Royal Hungarian Central Bureau of Statistics, 1936

cadastral yokes, possessed 24.5 percent of the land. On the other hand, 45.9 percent of the farmers with holdings of one to ten cadastral yokes, owned only 19.3 percent of the land.

The picture is considerably distorted by the inclusion of holdings with less than one cadastral yoke (1.421 acres). A number of these holdings, located near cities, were owned by small craftsmen and industrial workers who operated them for supplementary income. However, the majority of these plots were owned by people who earned their livelihood in agriculture, principally as farm laborers.

Comparing the 1935 distribution with that at the time of the last pre-war Census, in 1895, it becomes apparent that there was some shift in farm size distribution in favor of the smaller farms. The proportion of the area in farms of under five cadastral yokes increased by substantially more than the number. Also, the relative decrease in the area of farms of five to 100 cadastral yokes was much smaller than the proportionate decline in number. At the same time, the area in estates of over 1,000 cadastral yokes decreased from about 32 percent to 24 percent.

Effect of Reform Upon Land Tenure

The post-World War I land measures did not materially affect tenure conditions and relationships in Hungary's agriculture. Strip farming continued a basic feature of the country's agricultural pattern. On the other hand, close to 25 thousand entailed holdings

covering an area of 3.6 million cadastral yokes were still intact in 1935. Farm tenancy, in the sense of outright tenant operation, was not common, but leasing of land by owner-operators in order to enlarge their operating unit was spreading.

Widespread practice of strip farming aggravated problems on small holdings which were not economical in terms of size in the first place. In 1935, half the farms were composed of several plots, many times widely scattered. In fact these one million holdings were composed of 6.4 million plots—an average of six plots per farm. The average size of a strip was one hectare with many plots much smaller. It is evident that this type of farming permits only a very low level of productive efficiency, particularly in an extensive agriculture.

Strip farming is not peculiar to Hungary, but is fairly common in many parts of Europe. It is a product of the interaction of rapid farm population growth, limited non-agricultural employment opportunities, and inheritance practices which provide for equal division of land among all heirs. In many cases several separated parcels of land were allotted to heirs, in order to insure equity among them in regard to quality of land obtained. To the extent that this practice has been applied in the case of land distribution after the 1920 reform, it has tended to accentuate fragmentation of holdings

Effect of Reform on Agricultural Labor and Employment

Landlessness of the agricultural proletariat, it will be remembered, furnished the most potent drive for the land redistribution of the 'twenties. However, even on completion of the reform, the number of farm laborers who acquired land was relatively small, so this basic problem remained unsolved.

In 1930, out of two million actively engaged in agriculture, there still were 769 thousand landless. Their number dropped somewhat, to 746 thousand by 1941, as a result of some further land settlement and movement to cities.⁴ But the old problems of seasonal employment, unemployment and underemployment remained the plague of farm labor throughout the inter-war period.

Defining agricultural unemployment is at best complex, particu-

⁴ Thirring, Lajos; *Foglalkozási Eltolódások 1930 és 1941 Kozt* (Changes in occupational distribution between 1930 and 1941)—Magyar Statisztikai Szemle, Jan.-Feb. 1947, p. 3.

larly under conditions such as prevail in Hungary. The dominant characteristic of Hungarian agriculture is a marked concentration upon grain production, with over 70 percent of the country's cultivated area in cereals. The average annual labor requirements of grain culture are low; but there is a very high peak load at harvesting, and secondary loads at planting and cultivating time. This seasonality in employment was greatly accentuated by the dearth of farm machinery and the prevalence of large holdings completely dependent upon outside labor for their farm operations. This type of farm organization demands a labor force adequate to meet peak seasonal requirements even though it is unemployed or very inefficiently utilized during the rest of the year. Off-season employment opportunities for farm labor were extremely limited due to the relatively low level of industrial development and activity. This additional factor tended to depress farm wages and real annual earnings. Thus the cost of labor was partly shifted by the large holdings onto society.

Inasmuch as inefficient labor utilization is firmly rooted in the prevailing pattern of farm organization, it not only affects landless farm labor, but the self-employed smallholding peasantry as well. In the latter case, of course, periods of full employment, partial employment and unemployment are not clearly distinguishable over the year, but they nevertheless exist. The large majority of small holdings with the prevailing type of agriculture are unable to utilize fully the labor of the peasant and his family all year round.

This under-utilization of the agricultural labor force in under-developed economies may be termed "disguised unemployment." It applies to a condition in which the marginal productivity of labor over a certain range is close to zero. This does not imply that labor could be withdrawn from agriculture without decreasing farm production, unless this withdrawal of labor is accompanied by improvement in technology, changes in farm organization, or improved agricultural skills and practices.⁵

A number of empirical investigations of labor requirements in Hungary's agriculture⁶ seem to throw some light upon this problem.

⁵ Under some types of conditions where the marginal productivity of farm labor over a certain range may be at zero or possibly even negative, part of the labor force could be withdrawn from agriculture, leaving technology, farm organization, and practices unchanged, without affecting farm production.

⁶ Series of studies by Matolcs, Nagy, Kovacs, Szeibert and others conducted during 1930-39

These studies show that in the early thirties there were about 1.3 million men, 580 thousand women, and 158 thousand children in the agricultural labor force. These were capable of supplying an estimated 471 million man days of labor as compared to an estimated total labor requirement of 360 million man days. This indicates a waste of 24 percent of the available labor-time supply. Actually 20 to 30 percent of the agricultural labor force was employed for less than 200 days during the year.

The 1945 Reform and Its Results

The land reform of the 'twenties was not designed to solve effectively the problems of land distribution, agricultural labor and unemployment. Neither did it further the establishment and extension of middle-sized efficient family farm units. On the contrary, it led to the creation of a large number of dwarf holdings, insufficient in size to provide an adequate income to the farmer and his family. He was still forced to seek labor on the estates, which had fewer work opportunities to offer because of their somewhat reduced size.

Thus essentially the same economic and social problems and conflicts that harassed the agricultural economy of the country prior to World War I were still present prior to World War II. They helped propel the revolutionary forces determined to abolish the landed aristocracy once and for all.

On March 18, 1945, the provisional government issued a decree concerning the *Termination of the System of Large Estates and Redistribution of Land to the Peasantry*, which provides:⁷

Lands and properties of traitors, fascists, nazis, war criminals, etc., are to be confiscated outright, without regard to size of farm. On the other hand, owners of estates of above 1,000 cadastral yokes forfeit the right to retain land, but are compensated for their holdings. Farms of 100 to 1,000 cadastral yokes may retain 100 (only 50 in the case of farms located within a radius of 30 kilometers from Budapest) with the rest to be redeemed. Farmers who work the land themselves may keep up to 200 cadastral yokes, but distinguished soldiers of resistance and liberation may retain up to 300 yokes. In the case of vineyards and orchards, the maximum holding is 20 cadastral yokes with the proviso that such land may not be used for other types of production than heretofore. Community

⁷ Neplap, Debrecen, March 18, 1945.

pastures, agricultural research stations, government model farms and some others are exempt from all these provisions.

Forests receive separate treatment. All forests above 10 cadastral yokes are nationalized; those of 10 to 100 yokes become community, village or municipal property, while individuals may retain up to 10 yokes.

Holdings may keep as much farm equipment, livestock, buildings and other implements as are needed to work the remaining portion of the farm. Agricultural cooperatives absorb the balance of the equipment, some of which is retained for cooperative use while some is distributed to the farmers.

All landless farm servants and laborers, dwarfholders and small farmers are entitled to claim land. The maximum amount that may be allotted to anyone is 15 cadastral yokes of arable land and pasture, in addition to three yokes of garden and vineyard. In some exceptional cases, this may be increased to 25 plus five respectively. The new properties may not be mortgaged or subject to forced sale for ten years, except for taxes and the down payment on the land purchase price.

The new landowners are obligated to make a down payment of 10 percent of the purchase price, the latter to be fixed at twenty times the value of the cadastral net revenue. Down payments may be postponed for three years, with the remaining portion to be paid in ten to twenty annual installments. Estimates of the total cost to the peasants of the newly acquired lands have been set at 883 million forints (approximately 75.5 million dollars in U. S. currency).

On the basis of the law of 1945, about 43 thousand farms with

TABLE II. EXPROPRIATED AREA BY TYPE OF LAND USE

Land use	Area in cadastral yokes	Proportion of total
		<i>Percent</i>
Arable	2,879,112	51.4
Gardens	42,056	0.8
Vineyards	46,045	0.9
Meadows	345,133	6.1
Pastures	550,060	9.8
Forests	1,406,210	25.1
Other	331,029	5.9
<i>Total</i>	<i>5,599,645</i>	<i>100.0</i>

Source: *Gandzasghatstatistika Tajekhoztato*, Vol. I, p. 60.

close to 540 thousand cadastral yokes were confiscated outright and about 8,500 holdings, with 4.8 million yokes, redeemed. The total land made available for distribution was 5.6 million cadastral yokes which represents one-third of the country's land area.

These data indicate that over 3.2 million cadastral yokes have been distributed to individual claimants. This represents 58 percent of the total expropriated area. However, if forest land is excluded and the 3.2 million pastures allotted to village communities included, the relevant percentage rises close to 90.

The largest groups to benefit by the reform were the farm servants and laborers, who were landless, and the dwarfholders. Of these, farm servants fared best with an average per caput allotment of 8.4 cadastral yokes. While a holding of this size may not be conducive to prosperous farming under Hungarian conditions, it is considered to be above the minimum required for a farm family. Thus the status of this group has been considerably improved as compared to its state during the interwar period.

The average per caput allotment of the traditionally most disadvantaged group, the agricultural laborers, leaves them at the upper end of the dwarfholder category. This undoubtedly represents an improvement in their social status and possibly in their economic status. Many of these laborers, immigrants before the war, have now acquired a permanent home for the first time. Whether a holding of about five cadastral yokes is adequate to

TABLE III. DISTRIBUTION OF EXPROPRIATED AREA AND PER CAPUT ALLOTMENTS BY TYPE AND NUMBER OF BENEFICIARIES

Type of beneficiary individuals	Number of beneficiaries	Distributed area in cad. yokes	Average per caput allotment
Farm Servants	109,875	922,255	8.4
Agricultural Laborers	261,088	1,288,463	4.9
Dwarf Holders	215,930	829,477	3.9
Small Holders	32,865	143,131	4.4
Craftsmen	22,164	53,866	2.4
Professional Agriculturists	1,256	14,548	11.6
Forest Employees	1,164	6,998	6.0
<i>Total</i>	<i>642,342</i>	<i>3,258,738</i>	<i>5.1</i>
<i>Other beneficiaries^a</i>		<i>2,340,907</i>	
<i>Total</i>		<i>5,599,645</i>	

Source: *Gazdaságstatisztikai Tájékoztató*, Vol. I, p. 60.

^a Churches, public pastures, state forests, etc

provide the minimum necessities for the new farmer and his family cannot be answered on a priori grounds.

Those dwarfholders who have acquired an average allotment of about four cadastral yokes have been lifted out of the dwarfholder category entirely.

A significant feature of the recent land redistribution is that about 97 thousand farm servants and 200 thousand laborers were still left landless.⁹ Assuming that these were to receive an average per caput allotment of five cadastral yokes, an additional 1.5 million cadastral yokes would have to be found for distribution. This would necessitate lowering the permissible maximum size of holding from 100 to 50 cadastral yokes. There has been some pressure in this direction, but the authorities have been reluctant to carry out such a measure because of its potentially adverse effect upon total farm production.

The agricultural employment opportunities of these 300 thousand landless are extremely limited under the new conditions. With the disappearance of the large holdings, outside labor requirements have been drastically reduced. Therefore to the extent that these landless have not found non-farm employment opportunities,

TABLE IV. SIZE DISTRIBUTION OF FARMS IN HUNGARY IN 1947,
BY NUMBER OF FARMS AND AREA IN EACH SIZE CLASS

Size class (in cad. yokes)	Number of farms in each class		Area in each size class	
	Number	Proportion of total	Area	Proportion of total
		<i>Percent</i>		<i>Percent</i>
0-5	1,406,325	68.1	2,871,958	17.9
5-10	388,179	18.8	3,388,857	21.1
10-20	175,428	8.5	2,789,353	17.3
20-50	71,164	3.4	2,359,004	14.7
50-100	14,864	0.7	1,295,506	8.1
100-200	5,525	0.3	714,512	4.4
200-1,000	4,034	0.2	1,352,728	8.4
1,000-3,000 ¹⁰	504	neg.	796,007	4.9
Over 3, . . . ¹⁰	91	neg.	513,919	3.2
	2,086,114	100.0	16,081,844	100.0

Source: *Gazdaságstatisztikai Tájékoztató*, published by Hungarian Central Bureau of Statistics, Vol. I, No. 13, Dec. 1947, p. 696.

⁹ Computed on the basis of comparisons with the 1941 Census returns on the assumption that any war losses or out-migration were compensated by natural increase.

¹⁰ These are state holdings; there are none in private hands.

they are unemployed. Thus, part of the "disguised" labor surplus which was distributed over most of the agricultural labor force has been absorbed by these 300 thousand and converted, through them, into an open and real surplus.

Before attempting to appraise further the significance or effects of these recent land measures, it is essential to examine the new farm size distribution.

There are very few privately owned farms in the country today with more than 100 cadastral yokes. The 3.3 million yokes which are in larger units are state and public properties, mostly forests. For this reason, it seems appropriate to use in Table V farms of 100 yokes and less as the yardstick in attempting an evaluation of the new land situation and comparison with prewar conditions.

TABLE V. COMPARATIVE PERCENTAGE DISTRIBUTION OF NUMBERS AND AREAS BY FARM SIZE CLASS IN HUNGARY, 1935 AND 1947

Size class (in cad. yokes)	Number of farms		Area of farms		Average size of holding in each class in cad yokes	
	% of Total Number 1935	1947	% of Total Area 1935	1947	1935	1947
0-5	76 1	68 1	12.0	17 9	1.3	2 0
5-10	10 8	18 8	9 2	21 1	7 2	8 7
10-20	7.6	8 5	12 6	17 3	14 0	15.9
20-50	3 9	3 4	13 5	14 7	29 5	33 2
50-100	0 8	0 7	6 3	8 1	67 7	87.0
0-100	99 2	99 5	53 6	79 1 ¹¹	4.6	6 2

Source. See Table I and Table IV.

On examining Tables I and IV, it becomes apparent that the abolition of private estates above 1,000 cadastral yokes did not eliminate, but reduced considerably the inequities in landholding. The total number of farms was increased by almost 200 thousand as compared to 1935. The proportion of dwarf holdings (below five cadastral yokes) decreased, but the area in such farms increased sizably both in absolute and relative terms. As a result, the average holding in this group rose from 1.3 cadastral yokes to about two, which is an improvement even though it represents an uneconomical farm. However, the situation may be more favorable than this would indicate, since there are a large number of holdings of one cadastral yoke or less, located near urban centers and owned by industrial workers, craftsmen etc. Thus if the data would exclude

¹¹ The remaining 20% were mostly large state holdings.

these categories, the average holding in the dwarfholder category would be above two yokes.

The average size of holdings below 100 cadastral yokes increased from 4.6 to 6.2 cadastral yokes with the largest increase in the average of the 50 to 100 size class. This is due to the fact that prior to the new reform a much higher proportion of farms in the latter group was close to 50 cadastral yokes in size. However, with a ceiling of 100 cadastral yokes on size of farm, the larger holdings were reduced to this size, so the proportion of 100 yoke farms in the 50 to 100 yoke group increased, causing the average size of farm in the group to rise also.

It is apparent from the data cited that the 1945 reform went far beyond the land measures of the 'twenties, in that it completely abolished the latifundia in Hungarian agriculture and, by granting land to 400 thousand agricultural laborers and 200 thousand dwarfholders, created a large number of small farm units in their place. At the same time, it left about 300 thousand farm laborers landless, did not touch strip farming or customary inheritance practices, and thus left the way open for further fragmentation of holdings.

The execution of the reform was remarkably rapid. Less than three years were needed to complete this far-reaching land redistribution, while eleven years were required for a much smaller task in the 'twenties. However, the speed also had certain definite drawbacks, particularly in the early stages.

Appraisal of the 1945 Reform

The substitution of a large number of small holdings for the estates is likely to affect unit crop yields, density of livestock per unit of farm area, livestock production, crop utilization for food versus feed, share of crop marketed, efficiency of labor utilization in agriculture, and the whole pattern of farm organization. It would be premature to attempt at this time a conclusive appraisal of the economic effects of the 1945 reform. However, it may be worthwhile to indicate in broad terms the direction of the changes which may be expected under alternative sets of assumptions.

Low post-World War II yields in Hungary and other countries are sometimes adduced as proof of the negative impact of changes in farm size distribution upon farm production. But these low yields are as much a result of war devastation, consequent reduction in farm capital, and shortage of production requisites, as of

shifts in farm size distribution. It is however, true that if all other variables affecting farm production are kept constant, the net effect of far-reaching land redistribution is likely to be in the direction of lower crop, meat and milk production, with a lower share of the total farm product coming to market in the short-run.¹²

It is a handicap of most far-reaching land redistribution programs that they are usually instituted in a revolutionary post-war situation—that is, at a time which is politically particularly opportune, while it is economically most unfavorable. The establishment of a large number of new farms in a war devastated economy increases the agricultural capital requirements at a time of greatest capital stringency. Organization of new farms means more farm buildings, more tools and equipment, more livestock, and generally a higher investment per hectare. The landless agricultural laborers and dwarfholders, who comprise the bulk of the new farmers, usually have practically no savings or capital reserves, and therefore have to depend upon a disorganized and overstrained credit system.

The long-run net effects of changing size distribution, under static assumptions, are likely to lead, in addition, to a shift from wheat to corn production and to greater livestock numbers. However, these static assumptions, which are not too valid even in the short-run, become extremely tenuous in the long-run. On the basis of present indications, with government planning and intervention in the economic sphere, vigorous measures are being taken to improve farming practices. At the same time, such measures as organization of cooperative farm equipment stations may help to capture some of the economies of scale for the recently organized small peasant farms. Thus these measures may wholly or partly counteract the previously noted negative effects of changed farm size distribution.

However, to judge the success or failure of the reform on exclusively economic grounds may be misleading. This the more so since land reforms are not only economic but social and political measures as well. They are partly designed to reduce the social tensions and conflicts in agriculture by improving the status of the most disadvantaged groups. Their over-all success or failure therefore, must be judged in these terms as well.

Large landholdings which continued to be so important in Hun-

¹² This reasoning is based on the results of interwar investigations of comparative yields on small farms and on large holdings

gary up to 1945 were perpetuated at the cost of a highly depressed landless agricultural proletariat and a poverty-stricken dwarfholding peasantry. It was a system which tended to aggravate such basic economic maladjustments as pressure of population upon land resources, "disguised unemployment" in agriculture, low levels of agricultural intensity, and retarded techniques of farm production. However, it would be a mistake to conclude that land reform in and of itself can cure these economic ills. It may represent a necessary institutional pre-condition for the agricultural development of the country, but the solutions for these basic problems must be sought beyond the framework of tenure reform, in policies designed to raise the productivity of agriculture hand in hand with growing industrialization of the economy as a whole.

Rising agricultural productivity and efficiency which is a necessary concomitant of industrial development may be greatly retarded by the impediments of smallhold and dwarf peasant tenure as established by the recent reform. Agricultural development may lag considerably behind industrial development and thereby slow down the latter. Under such conditions, new economic, social, and political pressures could be built up for another radical change in the land tenure system in Hungary.

TEN YEARS OF THE FARM TENANT PURCHASE PROGRAM

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Ten years' experience suggests that the Bankhead-Jones Farm Tenant Purchase program must be redirected if it is to serve a useful purpose in an era of high employment, rising national income, and rapid technical progress in agriculture. Many Tenant Purchase (TP) loans have been too small to make efficient use of family labor or to yield a "minimum-adequate" income when farm prices are not extremely high; indeed, some borrowers may have reduced their incomes by accepting loans. The loans have not been larger because local public sentiment and Congressional opinion would not tolerate much improvement in the status of tenants, sharecroppers, and laborers who were "on the government." Within the limits thus prescribed, it has frequently not been possible, even with the useful devices of farm planning and supervision, to create what can be called adequate units. A large increase in the amount of the average loan seems plainly called for even though land prices decline from their current high levels. But the question must be asked whether a TP program involving loans of, say, \$20,000 or \$30,000 can serve the purposes intended by the authors of the Bankhead-Jones Farm Tenant Act or, for that matter, whether it should play any important role in a national agricultural program.

So far, of course, the TP program has not played an important role. From its inception in 1937 through June 30, 1947, the period covered by this study, the Farm Security Administration (and its successor, the Farmers' Home Administration) made TP loans totaling \$293,876,733 to 47,104 families. This is a very small beginning; there were still 1,858,421 tenants in 1945 and (if this were the objective) it would take the TP program nearly 400 years to make them all owners at the rate that has prevailed so far. The significance of the program does not necessarily rest on this basis however. Its proponents have always regarded it as a demonstration which (as President Roosevelt wrote in 1937) would be ex-

* The writer wishes to thank Professor T. W. Schultz for his criticism of an earlier draft of this paper and to express appreciation to friends in the Farmers' Home Administration who, while they do not agree with the conclusions reached, were generous with their assistance to the writer.

panded "to a scale commensurate with the magnitude of the problem as rapidly as our experience and resources will permit."¹ War and inflation of land prices have postponed expansion of the program, but it may take place fairly soon and on a large scale. In the Farmers Home Administration Act of 1946² Congress provided the machinery for rapid expansion by creating a mortgage insurance program to supplement the direct loans and by increasing the authorization for loans from \$50,000,000 for direct loans to \$150,000,000 for both direct and insured loans. If, as these changes suggest, something like a billion and a half dollars may be invested in this brand of tenure reform during the next ten years, it is surely important that the record of the TP program receive careful scrutiny. In this paper the writer undertakes to, one, trace the structural development of the program; two, summarize the record of loans made; and three, appraise the part the program may usefully play in the future.

The Bankhead-Jones Farm Tenant Act

Title I of the Bankhead-Jones Farm Tenant Act³ authorized the Secretary of Agriculture to loan a tenant, sharecropper, or farm laborer whatever amount might be necessary to buy and improve a farm. The Act set no upper limit on the size of the loan and it did not require that the borrower have any resources of his own, although it did give preference—"wherever practicable"—to those who could make a down payment or who had tools and equipment for farming. The loan was to be repayable over as many as forty years at three percent interest and the Secretary was authorized to offer a variable payment plan "under which a surplus above the required payment will be collected in periods of above normal production or prices and employed to reduce payments below the required payments in periods of subnormal production or prices." The Act provided that the borrower receive a deed to the farm and that the Secretary take a first mortgage; during the first five years of the loan the borrower could not sell the farm except with the Secretary's permission.

Although it set no upper limit on the amount of the loan, or the size of the farm, the Act did in effect set a lower limit by specifying

¹ Message to Congress, Feb 16, 1937, transmitting the report of the Special Committee on Farm Tenancy

² Public Law 731, 79th Congress.

³ Public Law 210, 75th Congress.

ing that no farm could be purchased unless "of such size as the Secretary determines to be sufficient to constitute an efficient farm management unit and to enable a diligent farm family to carry on successful farming of a type which the Secretary deems can be carried on in the locality where the farm is situated."

The Act required that loan funds be distributed among the states in proportion to farm population and the prevalence of tenancy. This meant that about two-thirds of the funds would be used in the South and one-fourth in the Midwest; in other regions the loans would have to be very few and far between.⁴ This requirement also meant that funds could not be allocated from state to state to suit administrative purposes.

The Secretary was required to establish a committee of three farmers in each county where loans were to be made. The committees were to certify as to the eligibility of applicants and the reasonable value of the farms to be purchased. No loan could be made without certification by the committee and the loan could not be in excess of the amount certified by the committee

Administrative Determinations

Administration of the TP program was placed in the Farm Security Administration, which had recently been created from the Resettlement Administration. FSA brought to the new program a point of view and a methodology which had evolved from relief and rehabilitation undertakings. Its approach qualified the Act in three important ways: 1, it set an upper limit on the size of the loan; 2, it set an upper limit on the economic status of eligible applicants; and 3, it made supervision and farm and home planning inseparable from the loaning process.

The limit on the size of the loan was set at the amount necessary to buy and improve a "family-type" farm, which FSA procedure defined as follows: "An efficient family-type farm management unit is a farm which furnishes full, productive, year-round employment for an average farm family and one which an average farm family can operate successfully without employing outside labor, except during brief peak-load periods at planting or harvest time. Such a farm must have the capacity to yield income on the basis of long-

⁴ Based on the 1945 Census, the distribution was as follows: South 66.86 percent, East 2 65 percent, Midwest 21.83 percent, West 4.48 percent, and Territories 4.18 percent. With the maximum appropriation authorized (\$50,000,000), less than one loan per county could be made in 21 states.

time prices which will maintain an average farm family according to acceptable living standards, pay annual operating expenses, pay for and maintain necessary livestock, and farm and home equipment, and pay off the loan.”⁵ While the farm could not be larger than this ideal, neither could it be smaller; the “family-type” farm might vary greatly in productivity from locality to locality but it would always be no more nor less than one average family could operate without much hired labor and it would always yield “acceptable” living standards. Under FSA procedure this formula was rigidly applied. Borrowers were even required to agree not to buy or rent additional land.⁶ During 1938 an absolute limit of \$12,000 was placed on loans because some applications under the family-size formula were for larger amounts than the Act seemed to the FSA administrators to contemplate.

FSA set an upper limit on the economic status of eligibles by limiting the loans to those who could not obtain “adequate credit at reasonable rates and terms” from other sources. This meant (so far as financial status was concerned) that anyone who could not obtain a bank loan for the purchase of what FSA considered to be a family type farm was eligible. Since a farmer would need at least 25 percent of the purchase price of a farm, as well as stock, equipment, and operating capital in order to obtain a bank loan, the upper limit of financial eligibility was thus set at a fairly high level.

Farm and home planning, which had been developed in the rehabilitation program of the Resettlement Administration, was given additional importance in the TP program. The borrower had two written versions of a plan. One was an annual plan, setting

⁵ This is the language of the procedure now in effect (FHA Instruction 421.1); it is essentially the same as that which was written in 1937.

⁶ FHA Form 317 (an “informal agreement” having no legal status but suitable for framing and calculated to impress the borrower) provides, among other things, that the borrower and his wife agree not to hire outside labor except as called for in the farm plan, not to rent the farm or operate it under a share-cropper arrangement, not to rent or operate additional land, not to purchase additional land or sell any portion of the farm, to sell to a buyer approved by FHA if it should become necessary to sell, and to try to maintain the farm as a one-family farm. This was intended to achieve by voluntary agreement what the Special Committee on Farm Tenancy hoped to enforce by withholding title for 20 years—the preservation of the family farm once established.

From December 1942 until June 1946, as a war measure, borrowers were permitted to rent land but only on the basis of a written agreement reciting justification and specifying that the rental would end when the emergency passed. Even so, the procedure (Administration Letter 636) required that each exception to the rule be approved by the Regional Director. The present policy does not provide for exceptions.

up a budget for the current year; the other was a long-term plan which outlined the goals and management methods for several years ahead. The plan was supposed to be worked out by the borrower in cooperation with the county FSA supervisor and it was to be the basis of the government's educational effort with the farmer as well as an agreement or understanding between borrower and lender. The plan also served as the basis of supervision. The borrower was in more or less frequent contact with FSA farm and home supervisors.⁷ The farm supervisor was responsible for administrative procedures in connection with the loans, for planning with the borrower, for giving on-the-farm technical guidance from time to time as necessary, and for reviewing borrowers' operations in a group meeting at the end of the year. The home supervisor advised the housewives concerning household accounts, nutrition, home production and preservation of food, health and matters of home economy generally.

The farm plans (as well as the farms purchased) fell into a few patterns; in each of the major agricultural areas there is a certain size and type of farm with which the TP program has been identified. All of the farm plans—even those in irrigated sections—call for diversification. Specialization has been almost entirely excluded. Production for home use has been stressed.⁸

The Act authorized the making of loans for the full purchase price of the farm *plus necessary repairs and improvements*. FSA established certain minimum standards of land development and of construction and required that these standards be met as a condition to the making of the loan. The standards of construction were based on considerations of safety and sanitation and were extremely modest (the average cost of 9,681 new dwellings built on TP farms through June, 1941 was \$1,406); nevertheless, in a typical year one-third of the average TP loan was used for repairs and improvements. Very little of this expense was income producing.⁹

⁷ In 1944 a Bureau of Agricultural Economics survey [*Study 122* (processed) Jan 1946] based on a sample of TP borrowers in the South and Midwest showed that 90 percent of the Midwestern borrowers were visited from two to four times a year. In the South about one-third were visited three or four times, 20 percent were visited five or six times, and 22 percent were visited seven times or more. Sixty-nine percent of the supervisors reported spending from one-fourth to one-third of their time with the TP borrowers.

⁸ Recently there has been an effort by top administrators to make the farms more "commercial." See the address by Paul V. Maris, *Making Good on What FSA Stands for from a Farm Ownership Standpoint*, (mimeo.) 1946, p. 8.

⁹ The minimum standards are set forth in FHA Instruction 423.1 and 424.1.

TABLE I. PERCENTAGE DISTRIBUTION OF TP LOAN FUNDS BY TYPE
EXPENDITURE, FISCAL YEAR 1941*

Area	Purchase of farm and inci- dental costs	Land improve- ment	Buildings other than dwellings	Dwellings		Total
				New	Repairs	
United States	67.9%	3.6%	10.6%	14.3%	3.6%	100.00%
East	81.2	0.7	13.0	0.3	4.8	100.00
Midwest	81.9	2.4	9.7	1.4	4.6	100.00
South	60.9	4.2	11.1	20.7	3.1	100.00
West	78.9	2.3	7.4	6.6	4.8	100.00

* 1941 was chosen because the subsequent inflation of building costs caused curtailment of new construction. In the fiscal year 1947 "Purchase of farm and incidental costs" was 76.0 percent of the total for the United States.

Sources: unpublished data from FHA. The distribution is given in dollars by states cumulative through June 30, 1940 in the *House Hearings on the Agriculture Department Appropriations Bill, 1942*; p. 82.

Engineering and farm planning assistance were provided by FSA without cost to the borrower. During the first year of a loan these and other (administrative) costs averaged \$329.38; for the next four years the aggregate cost has averaged \$667.08, and for the remaining 35 years of the full repayment period it is expected to aggregate an additional \$1,945.65. This is a total of \$2,942.11.¹⁰

The Tarver Limit

In five successive appropriations acts beginning with that of 1941, Congress provided that no loan might be made for the purchase of a farm of greater value than the average of all farms of 30 acres or more in the county where the farm was located. This was the so-called Tarver Limit, inserted in the Act each year at the insistence of Representative Tarver of Georgia, then chairman of the appropriations subcommittee. The loans in Mr. Tarver's state had averaged \$3,900, an amount he believed to be "twice too high." In the south as a whole (as of June 30, 1939), the average loan was \$4,668 and in the United States as a whole it was \$5,402.¹¹

According to these instructions, if a borrower resists the minimum standards "the remedy is not to force him to accept such standards against his will. On the contrary, the remedy is to refrain from making him an FO loan."

¹⁰ Unpublished data supplied by FHA.

¹¹ Mr. Tarver's point of view was as follows: "We are dealing here with the very poorest class of agricultural people. I think around two-thirds of the farmers of my district are tenant farmers. I do not see the point of buying one of those men a farm worth \$7,500 when you could buy four farms, for four tenants, at one quarter of the price, which would buy a fairly good farm in my district for a tenant and one with which 99 percent of the tenants in my district would be satisfied." *House Hearings*,

The Tarver Limit varied greatly from place to place (it was \$962 in Jackson County, Ky. and \$253,525 in Kenedy County, Tex.) but in 35 percent of all counties in the United States and 60 percent of all counties in the South it was less than \$4,000. In many areas where the rate of tenancy was very high it was impossible to buy a family-type farm within the Limit.

If the loans could not be made in one county because the Tarver Limit was too low, funds could be shifted to another county of the same state. But in some states the Limit was too low in almost all counties (Alabama, for example, had only two counties with Limits above \$3,000) and funds for these states could not be reallocated to other states because the distribution of funds among the states was governed by the terms of the Act. (Alabama, for example, got six percent of the national appropriation.) In these states it was not possible to use the full amount appropriated.

The appropriations act for 1944 contained (in addition to the Tarver Limit) a limit on the amount of funds that could be loaned in any one county. This amount was set at not more than twice what the county would receive if the funds were distributed among the counties on the basis of farm population and the prevalence of tenancy, provided, however, that any county might receive at least five loans. On this basis there were only 473 counties where more than five loans could be made. The restriction meant that funds could not be shifted from county to county to avoid the places where inflation of land prices was most severe. Because of the interaction of this so-called "Fund Limit" with the Tarver Limit and because of the effects of inflation, FSA was forced to return more than one-fourth of the 1944 appropriation to the Treasury.

This political interference handicapped the administration of the program, but it probably had little effect on the size of the loans that were made. There were political forces, however, which *did* influence the size of the loans by influencing the "family-type farm" standard itself. In the South, especially, public and Congressional opinion opposed setting the TP borrower above his neighbor; if the neighbor's status was woefully low, the borrower's would have to remain low too. Moreover there was a widespread feeling shared by many FSA personnel in the South, that a very modest improvement in the position of the borrower was all that should be expected.

Agriculture Appropriations Bill, 1941, pp 953-954. A report on the size of TP loans is given in these hearings.

ted.¹² These opinions markedly influenced the local administration of the "family-type farm" standard and they account in large measure for the fact that the average loan was not larger.

The Fund Limit was intended to prevent FSA from concentrating loans in "colonies". The Act provided no authority for FSA to purchase land for subdivision. Yet in some parts of the South (the Mississippi Delta, particularly) it was almost impossible to obtain a family-type farm except by subdivision. In these places FSA optioned tracts and made individual loans to whatever number of tenants might be needed to effect the subdivision. By June 30, 1943 FSA had created 4,604 farms by subdivision.¹³ From then until Dec. 31, 1947 only 1,348 farms were created by subdivision; the rate had slowed because of the Fund Limit, because of opposition from the American Farm Bureau Federation, which claimed that the Act was being "perverted", because of the increasing cost of building, and because FSA discovered that subdivision was "a very difficult thing to do well".¹⁴ At the end of 1947 the average tract had been subdivided into 4.3 units; several tracts, however, had yielded more than 100 units.

Section 505 (b) of the Servicemen's Readjustment Act of 1944 made veterans of World War II eligible for TP loans to the same extent as if they were tenants. In the appropriations act of 1946 Congress earmarked \$15,000,000 of a \$35,000,000 appropriation for loans to veterans. These funds could be distributed without regard to farm population and the prevalence of tenancy and without regard to the Tarver Limit.

Beginning in 1943, land price inflation made itself increasingly

¹² There was a good deal of controversy as to whether Southern borrowers should have bathrooms in new houses, the idea of a cropper, especially a Negro cropper, who was "on the government" having a bathtub while his neighbor had none was too much for some people to stand. So also was the idea of the borrower's having more stock or more land. The influence of this kind of opinion on the administration of the program can be seen in the words of Frank Hancock, then FSA Administrator, in his testimony (*against* the Tarver Limit, incidentally) before the Senate subcommittee on agricultural appropriations in 1945. "I am in full agreement with what I understand to be the principle underlying this restriction (the Tarver Limit). The government should not provide loans to set borrowers up on a higher plane than that of their neighbors who are successfully acquiring ownership of farms through their own efforts, and with their own savings, without government aid." Beyond this unwillingness to see the borrowers specially favored there was, no doubt, the fear that if their rise in the world was too rapid they might become "uppity."

¹³ A record of subdivisions by states appears in *House Hearings on Agriculture Appropriations Bill, 1944*, p. 1647.

¹⁴ Paul V. Maris in a letter to the writer. Mr. Maris added that FHA would resume making subdivisions as soon as building materials become readily available.

felt. This was true although FSA clung tenaciously to a conservative system of appraisal.¹⁵ Despite precautions, however, price inflation affected the loans to some extent. "Our borrowers are probably paying more for farms or getting farms of poorer quality and location than heretofore", the director of the Farm Ownership Division of FSA said in 1946. "If we were openly to advocate a definite percentage increase in prices paid for farms, in addition to the small adjustment in long-time commodity prices, that very fact might cause an excessive relaxation."¹⁶

In July, 1946 the Bankhead-Jones Farm Tenant Act was amended by the Farmers Home Administration Act and the following November FSA and the Crop and Feed Loan Division of the Farm Credit Administration were merged into the new Farmers Home Administration. While it retained the main structure of the TP program, the new legislation made several important changes in it.¹⁷ These changes had not had an important influence on the program as its tenth year ended on June 30, 1947.

The TP Loan Record

The before-acceptance tenure status of the borrowers who had active loans in 1945 is shown in Table II.

TABLE II. PERCENTAGE OF ACTIVE TP BORROWERS (1945) IN VARIOUS TENURE GROUPS AT ACCEPTANCE

Tenure group	United States	Midwest	South	East	West
Cash or standing renter	21.7%	17 2%	21 7%	43 2%	36.1%
Share renter	63.4	80 5	59 8	38 2	48 4
Share cropper	13 3	1.6	17 1	9 3	8 0
Farm laborer	0.7	0.3	0.6	2 5	4 0
Other	0 9	0 4	0 8	6 8	3 5

Source. Computed from FHA, *Release No. 3*, "Status of the Tenant Purchase Family in 1945."

¹⁵ Early in 1948 FHA appraisers were still making their calculations on the basis of ten cent cotton in Alabama, \$7.70 hogs in Indiana, 77 cent wheat in Nebraska, and 31 cent butterfat in New York. (*FHA Instruction 622 3*).

¹⁶ Paul V. Maris, *op cit*.

¹⁷ The FHA Act made the following important changes in the TP program. 1, provided for Federal insurance of mortgages to supplement direct loans with the stipulation that the insured-mortgage borrower make a down payment of at least 10 percent; 2, increased the interest rate to 3½ percent (on insured-mortgage loan 2½ percent plus 1 percent insurance charge); 3, gave eligibility and preference to qualified veterans of all wars, 4, retained the formula for distribution of loan funds among the states but gave each state a minimum of \$100,000 and provided veterans should be served in advance of the distribution of funds for tenant loans; 5, authorized

Although the Act specifically listed farm laborers among the eligibles, virtually no loans had been made within this very large group. This was not the result of deliberate policy; FHA (and FSA) procedure does not discriminate against laborers. However, the Act and the procedure give preference—"wherever practicable"—to applicants who can make a down payment or who have stock or equipment for farming, and this provision tended to bar farm laborers. Thirty-eight percent of the tenants in the South are sharecroppers (1945 Census) but only 17 percent of the Southern TP borrowers were sharecroppers at acceptance, a fact which indicates that the croppers, while by no means excluded, receive less than a proportionate share of the loans. The same was true of Negroes in the South. In eight Southern states having more than 30,000 colored tenants 49 percent of all tenants were colored (1945 Census) but in these same states only 23 percent of the TP borrowers were colored.

The size of loans varies greatly by regions.¹⁸ In the South (as of Dec. 31, 1945) 61.8 percent of the loans were for less than \$5,000 and only 5.9 percent were for more than \$9,000. The comparable percentages for the Midwest were 8.6 and 36.8; for the United States as a whole the comparable percentages were 47.6 and 13.8.

TABLE III. ACRES IN CROPS, TP FARMS IN 1945* AND FARMS RENTED BY ALL BORROWERS BEFORE ACCEPTANCE

Area	Acres in crops		
	Rented before acceptance	Owned in TP farm (1945)	Percent increase or decrease TP over rented
United States	73	75	2.7
East	77	74	- 3.9
Midwest	122	109	-10.7
South	58	65	12.1
West	97	90	- 7.2

* Many borrowers supplemented their TP farms with rented land in 1945. The average acreage of cropland rented was then as follows: United States, seven; East three; Midwest, 17; South, five; West, nine.

Sources: Adapted from FHA, *Release No. 3*, "Status of the Tenant Purchase Family in 1945."

loans to repair, improve, and enlarge farms of less than family size and to refinance indebtedness for that purpose; 6, substituted for the Tarver Limit a provision limiting loans to not more than the average value of an efficient family-type unit in the county as determined by the Secretary; and 7, converted the variable payment plan into a conventional arrangement for prepayment.

¹⁸ The size of the loan is virtually the same as the purchase price of the farm plus repairs and improvements; only 4.6 percent of the borrowers made a down payment and the average was only \$451.

These differences resulted from local variations in the "family-type farm" standard rather than from the—for the TP program—irrelevant fact that Southern applicants had less net worth.¹⁹

Except in the South, the TP farms have less cropland than did the farms the borrowers formerly rented. However, in 1945 the borrowers were still permitted to rent additional land. This rented land brought the total farmed by the non-Southern borrowers to slightly more than they had formerly rented.

Of the 11,233 borrowers (24 percent of all) who had repaid their loans in full by June 1947, 7,598 were known by FHA to have paid from farm income and to be continuing in operation of the farm when the final payment was made. FHA has no further record of the progress of these paid-up borrowers however. As of June 30, 1947, 4,606 TP loans had been liquidated by FHA.²⁰ Some of these loans had not been paid in full; the probable loss on these was estimated by FHA at \$71,575, a negligible amount in view of the total loaned. The amount advanced to all liquidated borrowers, however, was \$23,730,074. This sum, although it would be returned to the Treasury virtually intact, had not accomplished the purpose for which it was appropriated. The reasons for these failures, according to an analysis made by FHA in 1947, were chiefly accident, ill-health and old age (22.2 percent), change to other occupations (14.6 percent), dissatisfaction with location or community (11.7 percent), and deficiencies on the part of the borrower (10.9 percent). Inadequate farms accounted for relatively few failures (6.6 percent) and borrowers' objection to supervision for even fewer (2.4 percent).

The financial status of the active TP borrower in 1946 is shown by regions and for the United States in Table IV.

The 43,050 borrowers whose loans were active at the end of March 1947 had repaid 156 percent of the amount due under the repayment schedule.²¹ Fifty eight percent of them were ahead of

¹⁹ In 1945, for example, the average Southern borrower got \$4.04 in loan funds for every dollar of net worth, while the average Midwestern borrower got only \$2.93. New York and Illinois borrowers had almost exactly the same average net worth at acceptance but the Illinois borrowers got loans averaging 60 percent more than the New York loans.

²⁰ FHA, *Liquidation of Farm Ownership Loans as of June 30, 1947* (Mimeo'd).

²¹ Schedule is the amount required to amortize the principal and interest payments within the period of the note. On a 40-year loan bearing three percent interest schedule is 4.326 percent of the loan. The term "behind schedule" is used, rather than "delinquent," because, technically, the variable payment borrower may be billed for less than schedule. Actually, of course, there must have been very few instances since the start of the war when the bill was for less than schedule.

TABLE IV. STATUS OF ACTIVE TP FAMILY IN 1946

	United States*	East	Midwest	South	West
<i>Assets, liabilities and net worth</i>					
Net worth	\$6,044	\$8,461	\$9,014	\$4,654	\$9,821
Debts other than TP	446	1,665	525	337	1,446
Chattel inventory	3,680	7,311	6,441	2,534	6,636
<i>Income and Expenses</i>					
Gross family income	4,315	7,764	6,499	3,366	8,610
Cash farm income	3,388	6,676	5,631	2,442	7,290
Non-farm income	363	467	318	356	811
Value of home-use products	565	621	550	568	510
Cash family living expense	856	1,314	1,232	700	1,552
Farm operating expenses	1,538	3,899	2,379	1,100	3,802
<i>Use of net cash income</i>					
TP regular payments	569	508	991	430	1,018
Net debt repayment	188	509	261	142	523
Allowable capital expenditures	488	819	879	335	1,133

* Territories excluded.

Source Adapted from FHA, *Release No 7, 1946 Status Report*

schedule by an average of \$951. Seventeen percent were behind schedule by an average of \$266.

Repayment ability and net cash income were closely associated with size of loan.

On the basis of rather rough estimates,²² it appears that a considerable proportion of the borrowers, especially the Southern borrowers, would find it difficult or impossible to meet scheduled repayments if farm prices were to fall to, say, 1928 levels. At 1928 farm prices, the 1946 production of 60 percent of the Southern and 44 percent of all TP farms would have been worth less than \$2,000. If only the cash income from the TP farm is included (that is, if the value of farm-produced food used at home and of the products sold from *rented* acres is excluded), the 1946 production of the average Southern borrower (at 1928 prices) would be worth \$748 and that of the average of all borrowers \$1,957. If from this are deducted farm operating expenses (in the same ratio to cash farm income as actually obtained in 1946) and the scheduled TP payment, the remainder (the net cash farm income after TP payment at 1928

²² These estimates were made with the assistance of the Program Analysis Unit, FHA, using state indices of farm prices provided by BAE. Their chief weakness is that the following states were omitted from the calculations because comparable indices were not available: Arizona, Colorado, Connecticut, Maine, Massachusetts, Mississippi, Nevada, New Hampshire, Ohio, Oregon, Pennsylvania, Rhode Island, Tennessee, Texas, Utah, Vermont and Washington. These states include 25 percent of all borrowers.

prices) would be \$—19 for the average Southern borrower and \$526 for the average of all borrowers.

There is, of course, a close relationship between size of loan and the borrower's level of living. In 1945 cash family living expense varied from \$447 for borrowers with loans of less than \$3,000 to \$1,236 for those whose loans were \$11,000 or more. FHA's emphasis upon improvements to meet minimum standards of health and safety (but not of convenience) has not caused the borrowers to have

TABLE V SCHEDULE STATUS OF ACTIVE FO BORROWERS,
CUMULATIVE AS OF MARCH 31, 1947

Area	Number of borrowers (percent) and average amount				
	On schedule		Ahead of schedule		Behind schedule
	Percent	Percent	Amount	Percent	Amount
United States	25	58	\$ 951	17	\$266
East	34	48	848	18	302
Midwest	21	68	1,416	11	260
South	24	57	754	19	254
West	30	48	1,355	22	362

Source: FHA, *Report of Debt Payments by Farm Ownership Borrowers as of March 31, 1947*.

a markedly higher level of living in terms of specified facilities than the generality of resident-operators. In the South, 11 percent of all resident operators and 12 percent of the TP borrowers had running water in their homes in 1944; in the Midwest, the corresponding percentages were 24 and 25. Similarly, 27 percent of the Southern and 53 percent of the Midwestern resident operators had electricity as against 24 percent of the Southern and 50 percent of the Midwestern TP borrowers. In both the South and the Midwest, however, a larger proportion of borrowers than other farmers had radios and automobiles.²³

It is not easy to judge the effect of farm and home planning and of supervision upon the borrowers. The most significant data are those contained in an unpublished BAE study, based on a sample of borrowers in the Midwest and the South, *Attitudes Toward FHA Tenant Purchase Program*.²⁴ According to this study, 26 percent of

²³ These comparisons are based upon a sample of 295 Midwestern and 388 Southern borrowers in 1944 (BAE, *Study 122*, processed, January 1946, p. 101) and the Census of Agriculture for 1945.

²⁴ BAE, Division of Program Surveys, *Study 122* (processed) January 1946

the Midwestern and 18 percent of the Southern borrowers reported they had made no changes in their farming operations since obtaining their TP loans. Those who were aware of having made changes most frequently mentioned improved methods of soil cultivation, increased use of cover crops and pasture, and increased use of livestock. Very few mentioned increased mechanization or improvements in the physical plant. The borrowers who were most apt to change their farming operations were those visited by supervisors most often.

Although three-fourths of the Midwest borrowers said they had made changes in their ways of farming, only about one-fourth of them spontaneously mentioned the Farm and Home Plan in this connection. In the South, four-fifths of the borrowers said they had made changes, but only about one borrower in 15 mentioned the plan. Very few of the borrowers had what BAE interviewers termed an "inadequate" knowledge of the details of the plan, but less than half the midwesterners and only one-sixth of the southerners had what was called an "adequate" knowledge.²⁵ The borrowers who had changed their farming practices were those who were best informed about their plans.

Planning and supervision were not unpopular among the borrowers. Half the borrowers said their plans were helpful and a larger proportion considered the supervisors helpful. Four-fifths of the midwestern and three-fifths of the southern borrowers approved of the supervisors and only one or two percent said they actually disliked to have the supervisors visit. Home supervisors enjoyed about the same degree of popularity with the borrowers' wives. One-fourth of the midwest wives and one-half the southern wives said they would have run their homes differently without the Farm and Home Plan.

The BAE study revealed no relation between the borrowers' repayment status and change or lack of change in his farming practices, however, nor did it show any connection between repayment status and the nature of any changes that may have been made.

Tenant Purchase Perspectives

"It is to be doubted", Drs. Black and Hyson have written, "if

²⁵ The interviewers asked the borrowers specific questions about six aspects of their plans. A borrower who was able to supply information in any detail on all six was regarded as having an adequate knowledge of the plan. Detailed knowledge on three to five aspects of the plan was rated as fairly adequate. Ability to describe only one or two aspects was considered evidence of inadequate knowledge.

any program for agriculture in this country should be publicly supported which does not provide a net cash income for an able-bodied farmer in the prime of his life of at least \$60 a month (in addition to the use of the farm dwelling and food and fuel obtained from the farm)."²⁶ Judged by this standard over a representative term of years, the TP program probably could not be justified in the South, where 70 percent of the loans have been made. Elsewhere, too, many of the loans would fail to pass muster if farm prices were anything less than favorable.

Attempts to define a minimum adequate farm income are of course bound to be highly valuatinal.²⁷ A more useful concept for the economist (although not entirely free of the value element either) is that of efficient size. But even if it is assumed, as it is here, that a family-type farm should be large enough, in terms of technology and capital as well as land, to employ the family labor efficiently, i.e., so as to give equal rewards (including non-monetary rewards) with comparable endeavor in other occupations, the task of expressing the standard in specific amounts of land or capital is fraught with hazards.²⁸ It is not unreasonable to say, however, that if it is to purchase an efficient family-type unit the size of the average TP loan should be doubled or even tripled. In the South, for example, a single-family one-tractor unit may require from \$10,000 to \$30,000, while in the Midwest the real estate investment for farms requiring 14 to 20 months of man labor is estimated to be as much as \$32,970.²⁹ These amounts are indicative of the situation at the present time. Over the next 40 years, the period for which the TP loans are written, national productivity will doubtless increase steadily and spectacular changes in agricultural science and tech-

²⁶ *Quarterly Journal of Economics*, November 1944, p. 25.

²⁷ This can be seen from the fact that Black and Hyson believe a reasonable goal for public programs for farmers who happen to be veterans is twice as much as for others.

In 1941 FSA leaders set a very low standard, although certainly not from choice. They set the minimum cash living expense at \$50 per year for each member of the family. This was \$250 a year or \$20.80 per month for a family of five. *Hearings of the Select Committee of the House Committee on Agriculture to Investigate the Farm Security Administration*, (Cooley Comm. Hearings), 78th Congress, 1st Session, 1943, Part 2, p. 852.

²⁸ This formulation is paraphrased from Joseph Ackerman and Marshall Harris (eds.), *Family Farm Policy*, Univ. of Chicago Press, 1946, p. 389.

²⁹ These estimates are from "Study of Agricultural and Economic Problems of the Cotton Belt," *Hearings Before Special Subcommittee on Cotton of House Committee on Agriculture*, 80th Congress, 1st Session, 1947, p. 19, and *Capital Needed to Farm in the Midwest*, Bulletin 889, Agricultural Experiment Station University of Minnesota, North Central Regional Publication No. 5, January 1946, p. 9.

nology are not at all unlikely. The amount of capital required for efficient family-type farming may therefore rise sharply. In this context, the question must be asked whether a TP program making an average loan of, say, \$30,000 would serve the purpose of the Bankhead-Jones Farm Tenant Act, or indeed, any useful purpose at all.

The TP program was conceived in the South in answer to the question, asked in 1935 by the authors of *The Collapse of Cotton Tenancy*: "What is to become of the half million to million farm families—the two million to five million individuals—who are no longer needed as cotton tenants?"³⁰ As late as 1941 the administrators of FSA were assuming that the cities could not provide jobs for these millions and that therefore the only opportunity was to improve their status on the land.³¹ Today the outlook is radically changed. A large number of farm people left the land during the war and it is now widely agreed that productive work can and must be found outside of agriculture for others who are no longer needed there.³² The function of a long-term credit program in the South today is not to create the maximum number of minimum-sized farms, but to assist boldly and creatively in the reorganization of Southern agriculture—a reorganization which, now that its technical basis exists in DDT, super-phosphate fertilizer, and improved pasture grasses, is proceeding very rapidly. For this role, the TP program with its emphasis on planning and supervision, would be wonderfully well fitted if the loans were of sufficient size³³

Outside of the South, technological advance since 1900 has caused a rapid drop in the number of inadequate farms and a steady increase in the number and size of family and larger-than-family farms.³⁴ The financial position of farmers is better than at any time

³⁰ C. S. Johnson, E. R. Embree, and W. W. Alexander, Chapel Hill 1935, p. 46. It is interesting that these authors, full of sympathy for the tenants but writing in the depth of the depression, should have recommended "small plots of minimum size required to support farm families, probably twenty to forty acres in the cotton states."

³¹ In March 1941 FSA's objective was "to reduce the number of farm tenants . . . to about one million during the next 40 or 50 years. This will mean converting tenants into owners at the rate of about 80,000 per year." *Cooley Committee Hearings*, op. cit. Part 2, p. 852. See also the "ultimate picture," pp. 860-861.

³² See the testimony of the then Assistant Secretary, Charles F. Brannan, in *Hearings on Long-Range Agricultural Policy*, 1947, p. 9.

³³ The credit requirements listed in *A Conversion Program for the Cotton South* (BAE, mimeo'd. Washington: 1945) totaled (in millions) \$2,386, broken down as follows: farm purchase or enlargement, \$850; farm buildings, \$632; equipment, \$632; and livestock, \$272.

³⁴ J. C. Ellickson and J. M. Brewster, "Technological Advance and the Structure of American Agriculture," this *Journal*, 24. 4 (November 1947) p. 838.

in our history; their liquidity has risen in recent years from about 4.5 to 23 billion dollars, a circumstance which has reinforced and accelerated the trend toward larger units. Borrowers having the larger, more efficient farms will find it easier to repay their loans (especially if amortization schedules take account of income fluctuations), but it will be harder for tenants starting from scratch to acquire enough capital for ownership; down payment requirements will be stiff.³⁵ In this outlook there is a small but useful place for the TP program in providing farm ownership opportunities for those capable tenants who are unable to make down payments.³⁶ With farm development and improvement loans, however, FHA might make a more important contribution in the Midwest and in the arid and semi-arid West; farm development and improvement (particularly as regards soil and irrigation improvements) is a field in which adequate credit has always been lacking. If the development and improvement loans were of sufficient size and if the amount and quality of supervision and farm-planning were increased somewhat, FHA might open this field with great profit to its borrowers.

Americans have always hated and feared land monopoly. Without falling into the error of creating farms that are too small, the TP program could be aggressively used to break up the large corporate land-holdings of the South and West, thus accomplishing what the Preemption Act, the Homestead Act, the Reclamation Act and many other laws have so far failed to do. This, in the writer's opinion, would be a highly desirable objective, but one justified on political rather than economic grounds.

The steady and rapid advance in the amount of resources required for efficient farming makes the infeasibility of converting large numbers of farm tenants into owners more and more apparent how-

³⁵ See J. F. Timmons, "Farm Ownership in the United States" this *Journal*, 30 1 (Feb. 1948), p. 95.

³⁶ Although no attempt has been made in this article to evaluate the developments which have taken place since passage of the FHA Act, some comment should probably be made here regarding the insured-mortgage loans authorized by that Act. To obtain an insured-mortgage loan the borrower must make a down payment of at least 10 percent. This will exclude most Southern tenants (only about one in ten of its present borrowers could have met that requirement without impairing operating capital, FHA estimates). In the Midwest, the down-payment requirement will cause FHA to select its borrowers from an even higher socio-economic group. This will mean that the gap between the amount of capital which could be rented and the amount which can be borrowed (a gap already sizeable in the case of the borrowers who receive 100 percent loans, Table III suggests) will be widened. Elimination of the variable payment feature and (in other legislation) increasing the interest rate on both direct and insured loans to four percent will further decrease any advantage the non-Southern borrower might have in borrowing as against renting.

ever. The problem of rural poverty and insecurity, it now seems quite clear, must be solved in the cities. This is a conclusion that will be resisted by many valiant people who have struggled with great skill and tenacity to make the TP program a vehicle of reform in a segment of American life which was, and still is abysmally in need of reform. But the fact—the heartening fact—is that national and agricultural productivity are moving sharply upward and, moreover, the time for more fundamental reforms is near at hand.

THE BRANNAN PLAN AND FARM ADJUSTMENT OPPORTUNITIES IN THE COTTON SOUTH

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I. Income Effect

NO OTHER major agricultural region in the United States has more to gain for itself, or can add more to the sum total of national economic well-being as a result of increased income than can the cotton South. Increased income can provide a base out of which to finance long needed capital investments in both physical and human resources—investments for which the marginal rate of return is extremely high and without which there can be no real improvement in the South's productive capacity. The necessary funds for these investments, except in a few short periods of highly favorable economic conditions, however, have not been obtainable.

The rural South probably remains the most undeveloped market to be found in the United States for the products of both factory and farm. When they have high enough incomes, southern farm people buy their share of automobiles, refrigerators, electric stoves and other conveniences and services that are a part of our modern culture. They also eat their share of a large variety of nutritious foods, much of which is shipped into the South from other farming regions. The percent of farm population in low income groups in the South is higher than in any other section of the United States as indicated by the following data.

PERCENTAGE OF FARMS (OR FAMILIES) WITH CASH SALES OVER \$400,
HAVING SPECIFIED SALES IN 1946^{2,3}

Range in gross income	Percent of all farms				Approximate net cash income
	U. S.	North	South	West	
\$ 400-999	22 0	13.7	31 9	14 9	\$ 200-499
1,000-2,499	30.4	23 3	39 6	20.6	500-1,249
2,500-5,999	27.4	34 0	20 7	26 2	1,250-2,999
6,000 and Over	20.2	29 0	7.8	33 3	3,000 and Over
Total	100.0	100.0	100 0	100 0	

¹ The author acknowledges substantial aid in the preparation of this paper from Robert G. Spitze and Waldo S. Rowan.

² Basic computations by Farmers Home Administration and B A E. Approximately 1,000,000 farms with less than \$400 cash sales were excluded because they were self-sufficient, part-time or retirement farms. As compared with 1946, farm income in 1948 will be lower than in either 1946 or 1947.

³ From Public Affairs Bulletin No. 67, Library of Congress, Washington, D. C., March 1949.

With such a high proportion of the people possessing a high propensity to consume, any increase in income to these consumers will have a healthy influence on the maintenance of a flow of purchasing power in the total economy.

The Brannan Plan aims at a continuation of the present favorable level of farm income relative to non-farm. From an income standpoint the South has much to gain from these proposals in contrast to existing legislation which provides price supports only on a few basic crops and at some 20 percent lower levels on these. If a favorable level of income to Southern agriculture can be maintained, the South has the opportunity to continue the rapid progress made in recent years in adjusting its farming economy; that is, if it does not at the same time interfere with the movement of resources out of one kind of employment into another, either within agriculture or between agriculture and the non-farming economy.

It is recognized, of course, that such a price plan as the Brannan proposal cannot supply all the aid needed by the relatively poor and inadequate farms. Supplementary assistance is needed here. Neither would this plan change the relative income standings of the low and the high income farmers, a change which is politically and economically feasible only over a long period.

II. Effect on Resource Use

Artificially fixed product price relationships provided for in price support programs can themselves be a major obstacle to a desirable use of resources. In the South, however, the fixed price relationships as proposed in the Brannan Plan are not likely to have any major effects on resource uses at least until considerable progress has already been made in farming adjustments. The responsiveness of cotton farming to price changes is greatly limited by many other, and perhaps more important, resistances. Included among these are such factors as: (a) Backing up of an abundance of cheap, unskilled, untrained labor on farms as a result of high birth rates and occupational immobility (b) The forms and amounts of capital which are adequate and appropriate for cotton farming, but inadequate and inappropriate for many other kinds of production. (c) A high percentage of tenancy which hinders development of long-time farm production plans and thus closes to many people otherwise feasible adjustment opportunities. Where farmers in the South have been able to overcome these obstacles, they have been

able to make adjustments that have been profitable under any recent historical set of price relationships. In the future these will continue to be the crucial considerations rather than the precise level of cotton prices relative to other farm products. Actually, during the recent decade of high prices for agricultural products, there has been a sizeable shift from crop to livestock production in the South.

CASH INCOME FROM THE SALE OF CROPS AND LIVESTOCK
SOUTH CAROLINA AND GEORGIA, 1940 AND 1948

	1948	1948	1948 as percent of 1940 ⁴
Livestock and Livestock Products	\$ 51,650	\$232,598	450
All Crops	190,258	640,018	336

This shift was made at a time when the prices of milk and beef were favorable in comparison with cotton and tobacco and perhaps even more important when the level of income to farmers was high and labor was relatively scarce. The Brannan Plan proposes to maintain livestock prices at this favorable level in addition to a relatively high support level for the crops. The maintenance of these recent price and income relationships would, of course, facilitate continued adjustment in the South to livestock. In contrast, existing legislation offers no assurance that livestock products will not drop to a level unfavorable to that of cotton and tobacco even though these are supported at somewhat lower levels. To the extent that additional price certainty would result in more production of supported perishable products due to shifts in enterprises, the consumers will realize more abundant supplies and lower food costs. With the large amount of resources not fully employed and the relatively low income pattern, the South stands to gain here with lower food costs and subsequent higher standard of living for both its urban and rural people.

Price certainty, however, is not to be confused with market certainty. In his statement on April 7, Secretary Brannan stated: "For fluid milk, marketing agreements and orders should be continued." High price guarantees secured by marketing quotas, instead of facilitating the conversion from cotton to dairying, can very effec-

⁴ Prices of both livestock products and crops in 1948 were around 300 percent of 1940.

tively hinder such conversion. Much depends here, as is the case with many other phases of the Brannan proposal, upon choice as among the various alternatives suggested in the plan for the maintenance of high support prices.

Under the new proposal two of the so-called basic commodities have been deleted in Brannan's priority list. Though these crops, peanuts and rice, are not so important relative to tobacco and cotton, they are the sources of much of the income in certain sections of the South. Peanut producers usually can shift to other production and this industry is realizing new markets that may affect the price level. However, acreage allotments are already in effect. Peanut producers would have an alternative market through hog production in areas where there is adequate fencing. Rice on the other hand, is grown in areas where alternative use of the resources is restricted.

There is little warrant for the fears that artificially supported high farm incomes will intensify the problem of population pressure on land resources. It is doubtful that any recent set of price relationships is an adequate explanation for the origin of this problem. And in turn, it is doubtful that the solution of this problem is to any appreciable extent contingent upon changes (at least any immediately foreseeable changes) in price relationships. Involved in this problem of population pressure on resources is the production of human beings. This is a kind of production in which the South, at least in numerical terms, excels other farming regions. It is perhaps, even more than cotton, the South's major surplus product. When this product clears the market at a fairly remunerative level, cotton also clears the market at fairly good prices. When labor is cheap enough cotton can be grown at a very low level of prices. Attempts to deal with this surplus of labor solely from the demand side may give temporary relief, but only temporary relief if the present high level of labor supply continues.

In many parts of the South, of course, there are few opportunities for a marked change in the allocation of resources without the movement of large numbers of people off the farms and without a corresponding increase in the supply of capital. But even this is an over-simplified statement of the obstacles to agricultural adjustments in the South, as is perhaps well illustrated by what has happened in Greene County, Georgia, in the last few decades. In

Greene County the Soil Conservation Service in its land-use capability survey classified approximately 144,000 acres of land as suitable for cropland uses. Yet in 1944, cropland harvested was only 51,296 acres. Here acres of cropland used per farm family averages about as low as it was before nearly half the farm families, under the tremendous impact of the cotton boll weevil, moved away in the 1920's. Judged by the amount of land in use per farm family one finds here as great pressure of population on resources as occurs in most parts of the South. Yet not infrequently, one also finds many farm families living on farm units that have as much land idle as is in productive use—land that is about as productive as the land in use.

Recognizing the tremendous adjustment opportunities and problems in this general part of the Piedmont, the Farm Security Administration selected Greene County as the location for an intensive credit program. To the present time, slightly more than 1,000 farm families in the county out of an estimated 1,600 farm families now in that county have received liberal credit and intensive supervision under terms of the Farm Security Administration or its successor, the Farmers' Home Administration. Consequently, in recent years there has probably been little capital rationing in the county in any meaning of that term that is relevant to action.

On the whole, this program has accomplished much good, especially viewed from the standpoint of the tremendous difficulties faced. With liberal credit and supervision, a few farmers in the county have made the conversion from cotton to combination cotton-livestock farming. Several of these beginning with a minus net worth have paid for their farms and for capital additions needed for conversion in type of farming in three to five years. But it remains that for the majority of farm families aided by the Farm Security Administration in this county, there seems to be little hope of increasing their incomes by internal farm adjustments, unless they can do so using one-mule farming equipment and producing their usual acreage of cotton combined with feed and food production for farm and home uses. Records covering several years of their experience indicate that more capital than can be effectively used for such limited purposes on these farms is an economic waste. This is not because of any scarcity of land suitable for an expansion in their farming operations, nor because they lack access

to capital, but because with their valuations and their ideals and purposes, it is an almost insurmountable task to induce them to make the change from cotton to other kinds of production. Increased investment in education will necessarily have to go hand in hand with increased investment in physical capital goods if those physical capital goods are to increase the productivity of these workers. But adjustments necessarily have to begin with these people as they are. Because of their age, size of families, lack of education, and other limitations, it is also doubtful that many of these farm families would fare much, if any, better in non-farm employment of the kinds available or of the kinds for which they are now fitted.

If this same general situation is fairly widespread in the South, then there are many people for whom cotton production is about their only feasible production alternative, whether cotton is 27 cents per pound or only 10 cents per pound. Whatever else one may say of the problem of rural poverty or of rural welfare (within which category the problem of economic efficiency in its broader social context would seem to be embraced), it is at least a problem for which remedies cannot be easily superimposed, even by over-all price support programs. Indeed, apart from an increased awareness of the existence of problems on the part of the people who themselves are most affected, including an awareness of means suitable for their solution, there is probably no adequate solution at all. Increased educational opportunities can help people develop the values and ideals without which they have little incentive to change. A high price and income policy is likely to have little effect here except as it may indirectly increase investment in the education and cultural development of the people.

III. Production Control

In the first section of this paper the importance of a high level of income was stressed as a means of facilitating farm adjustments in the South. The second section attempts to point out the limitations of relative prices in bringing about a desirable allocation of resources in the South. But over the long pull, and to the extent that these other barriers to efficient resource use are overcome, relative prices will guide resource use in the South as elsewhere.

This section will be devoted to a brief statement of the conditions within which production controls may be used to improve farm

income and resource use in the South. In the interests of brevity the discussion will be limited to cotton. Acreage allotments and marketing quotas for cotton appear to be a certainty under existing legislation as well as under Brannan's proposals. What benefits can be expected from them? The demand for American cotton is a part of a broad demand for fibers. The supply of American cotton is a part of a highly competitive world supply of cotton and other fibers. It should be obvious that cotton prices determined by these influences cannot be raised significantly by restrictions in the supply of American cotton alone. Unless cotton is moved into other countries with the help of a subsidy, cotton growers would lower their income from cotton rather than increase it by production restrictions.

Yet because of the probable severe undesirable income effect on cotton producers in the years immediately ahead, if cotton prices were allowed to fall to free market levels without income supplements, price supports and acreage restrictions may assist Southern farmers in making the necessary adjustments in their farming operations. If livestock prices can be maintained at relatively favorable levels, and if aggressive educational and credit programs can be organized as a supplement to the price support and marketing quotas for cotton, resources freed from cotton production may be diverted into livestock production at a fairly rapid rate. The important considerations are that appropriate government export programs be developed to maintain a reasonably large export of American cotton, that domestic cotton prices not be maintained at levels which significantly stimulate increased substitution of domestic synthetic fibers and that cotton prices not be held at such high levels relative to other farm commodities such as livestock products, as to remove the present economic incentives for shifting to diversified farming operations.

If production controls are utilized to implement price supports for cotton within these limitations, significant progress should be made both in the organization of cotton production and in the substitution of livestock for cotton, lessening the need for continued export subsidies and government income supplements in the South.

IV. Conservation Measures

With a predominance of row crops, long seasons of exposure, a dense population in agriculture, and low farm income, much of the

soil in the South has been badly depleted. A commendable beginning has been made on this problem by the various educational agencies, A. A. A., and Soil Conservation Service. In addition to the understanding of the need and method of conservation, farmers must see a security of return on their time and money in the short run to invest in the soil.

So far price supports to maintain an adequate income for farmers have had only an indirect relation to programs designed to encourage conservation. Farmers often fail to see the contribution conservation practices make to income received for their production. The Brannan plan proposes to tie these two segments of agriculture together in two ways. To the extent that conservation practices mean more forage crops, proposed price supports on livestock products assures farmers a favorable return for them. Even more directly a farmer must meet minimum conservation requirements in his farm plan to be eligible for price supports under the new proposals. Of course the requirements for conservation in this plan are unknown and subject to suspicion. For the South, it must be realized that measures to improve conservation of the soil within socially acceptable means meet a dire need. Certainly the maintenance of a high level of income and the supporting of livestock prices at a favorable level with crops are additional factors in the plan to encourage conservation.

V. Other Provisions Needed

The Brannan Plan, even though the level of price supports remained at proposed 1950 levels, would be a major improvement over existing legislation. But if enacted into law the Brannan Plan should be amended to provide for more price flexibility, at least in the event sufficient funds are not appropriated to accomplish the income objective of the program. Otherwise, it may result in widespread economic displacement. It might also be amended to extend the compensatory payment approach to storable commodities. (With modern food preservation methods much of the validity for the distinction between perishable and non-perishable commodities disappears, with the distinction if valid turning more on economic than on physical grounds.) For cotton, however, if we can assume that the government would institute an effective resale program, disposing of excessive stocks at world market

prices, then the compensatory payment approach, as opposed to loans (that in effect likely may become direct purchases), would do little more than add to administrative costs. The loan or direct purchase approach would mean, of course, that government would perform more of the trading functions, a likely objectionable feature from the standpoint of the cotton trades industry.

An income support program tied to commodity marketings obviously is not a solution of the income problem of farm people who produce little or nothing to sell. This perhaps is the major weakness of the Brannan plan from the standpoint of many Southern farm people. On the other hand, there probably remains to be worked out what is a politically feasible plan of national income distribution adequate for the solution of the income problem of extremely low income farm people.

Presumably price support programs for Southern crops, especially cotton and tobacco, are predominantly programs for helping low income farmers. Out of 1,589,706 farms reporting cotton harvested in 1939, almost 80 percent, 1,243,464 reported fewer than eight bales of cotton harvested. These farms accounted for 49 percent of the acreage and 37 percent of the cotton produced. The significant economic fact is that this large group of farmers, almost all of whom were in the A.A.A. program, had an average value of farm products sold, traded, or used by the farm household of \$560.⁵

Essentially the same situation prevails for tobacco. Even more farmers are growing small acreages of tobacco than before allotment programs were started. Probably 75 to 80 percent of all farmers reached would be classified as low income farmers.

With but a few modifications the Brannan plan contains no new provisions that could not be found in present and past agricultural legislation. Enacted with a view to early amendment wherever experience reveals it to be inadequate or inappropriate in either means or objectives, or preferably provided sufficient discretionary authority for its administration, including authority for more flexible prices, the Brannan plan may be instrumental in effecting a more orderly adjustment in agriculture during the post-war years. Certainly the administrative authority should be broad enough to prevent a recurrence of such wastage as that in the

⁵ Census of Agriculture: 1940, Special Cotton Report, page 2.

present potato program. At best any approach to the income problem of agriculture may be attended by some wastage of human and physical resources, including a free price policy, if southern economic history has any meaning for this problem. It is also doubtful that anyone has thus far found a single simple answer to either the farm price and income policy issue or to the problem of agricultural adjustments in the south.

GREAT PLAINS AGRICULTURE AND BRANNAN'S FARM PROGRAM

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THE agricultural program presented to Congress by Secretary Brannan in April and May departs in several respects from the programs which have been followed since the early days of the New Deal. A revised concept of parity which places the base for computation on income rather than on price, a change in method of stabilizing farm income, a device for preferential treatment of the family farm, and a greater emphasis on farmer responsibility and initiative for instituting production or market controls are main features of the original presentation.

Brannan's program is based on the idea of maintaining farm income through (1) production payments on non-storables, and (2) high support prices for storables. The non-storables account for about 75 percent of the gross income of agriculture. Prices for these would be allowed to seek the market level and prices for storables would be maintained according to the new support formula. The reaction of farm leaders to the program has varied from coolness to outright opposition, the chief exception being the Farmers Union.¹ Most of the producer groups which have testified have indicated their preference for price support rather than production payments whenever the choice has to be made. Some have indicated that they would favor rather strict production and marketing controls if necessary to maintain the prices of their products.²

Arguments advanced by Brannan when presenting his program and arguments advanced in most of the testimony which has fol-

¹ See *National Farm Program*, Hearings before the Committee on Agriculture, House of Representatives, 81st Congress, 1st session, April 11-May 19. See especially the testimony of the following organizations: Farmer's Educational and Co-operative Union, April 27; the American Farm Bureau Federation, April 28; The National Grange, April 30 and May 12; American National Livestock Association, May 2; National Woolgrower's Association, May 2; The Texas and Southwestern Cattle Growers Association, May 2; National Cooperative Milk Producers Federation, May 3; National Potato Council, May 4; National Council of Farm Cooperatives, May 10.

² This statement applies especially to the testimony of the National Cooperative Milk Producers Federation and the National Potato Council. An exception is the National Woolgrower's Association testimony. The American National Livestock Association reiterated their opposition "to governmental subsidies and controls." See references cited in footnote 1.

lowed appear to develop from the major premise that depressions in an economy such as ours are "farm bred and farm led." This premise, which may or may not be tenable, has focused attention on *how* agricultural income is to be supported rather than *is* it to be supported. If the premise is accepted a choice between the methods available for supporting income is imperative. The split between the producer group solution in the interest of their own welfare, and the solution in the interest of the general welfare may become the central issue. The interest of the general welfare may become so apparent as to force adoption or modification of certain of the proposals which are being debated. In spite of recent testimony, this action may be hastened by difficulties of administering the current price support program.

How would Brannan's program work in the Great Plains and what modifications may be suggested? Would it provide farm income stability and increasing efficiency in production? Or would it put Great Plains farmers in a production strait-jacket without corresponding income compensations? A definite answer to these questions cannot be made at this time because the answer depends on the level at which controls may be instituted and the conditions which are attached to production payments, price supports, etc; but it is possible to appraise the merits and the shortcomings of the broad outline presented by Brannan.

What does the Great Plains area require in an agricultural program? The area is peculiar in two respects: (1) the extreme variability or flexibility required in operations to reach maximum efficiency, and (2) the extreme variability in income associated with a fluctuating dry-land crop and range livestock economy. Furthermore, in some areas of the Plains specialization in a single enterprise—typically wheat, beef cattle, or sheep—is the rule rather than the exception. The program which would be best adapted to the area should do the following: (1) promote increasing efficiency in resource utilization; (2) counteract the extreme instability of income; and (3) move toward an expanding level of real income and greater social welfare. What does this involve?

Resource Utilization in the Plains

Great Plains agriculture is still in a stage of rapid readjustment. The overcapitalization following World War I, the forced liquidation of the early '20's and the drouth and low prices of the '30's,

have been followed by an unprecedented boom. The boom is the result of high prices and of unusually favorable weather accompanied by rapid advances in technology. The number of farms is declining and farms are still growing larger (Table I).³

TABLE I. NUMBER AND AVERAGE SIZE OF FARMS IN THE GREAT PLAINS STATES

States	Number of farms		Percent decrease in number	Average acreage per farm ^a		Percent increase in size
	1935	1945		1935	1945	
Montana	50,564	37,747	25.4	940	1,557	65.6
N. Dakota	84,606	69,520	17.8	462	590	27.7
Wyoming	17,487	13,076	25.2	1,610	2,533	56.7
S. Dakota	83,303	68,705	17.5	445	626	40.7
Colorado	63,644	47,613	25.2	471	761	61.6
Nebraska	133,616	111,756	16.4	349	427	22.3
Kansas	174,589	141,192	19.1	275	344	25.1
Oklahoma	213,325	164,790	22.8	166	219	31.9
New Mexico	41,369	29,695	28.2	831	1,671	101.1
Texas	501,017	384,977	23.2	275	367	33.4
All States	1,363,520	1,069,076	21.6	355	501	41.1

Source. United States Census of Agriculture, 1935 and 1945

^a In 1935, large acreages of "free" land were used by ranchers without legal control and these acreages were not included in the census reports as part of the farm unit. Since then, competition for the use of grazing resources has forced operators to lease or buy most of this land and the acreages are included as part of the farm unit in later census reports.

If public programs do not limit the size of farms, the trend on the Great Plains toward fewer but larger farms may continue for some time. The major wheat growing areas of the Plains, and much of the agriculture of irrigated areas appears suited to a high degree of mechanization which is easily adapted to the larger farm units. Ranches have been changing in four respects. (1) Existing ranches have expanded to the extent that nearly all grazing land is now under the legal control of some operating unit. (2) Fewer animals are being grazed on a given acreage. (3) Costs per animal unit have risen. (4) Capital position of the typical rancher has improved.

The combination of high prices and above normal rainfall which has occurred since 1941, within a setting of increasing mechanization, has resulted in a marked expansion in wheat acreage.⁴ Land

³ The trends shown in Table 1 appear to have accelerated since 1945.

⁴ In the Plains area of the 10 Great Plains states more than four million acres of grasslands were broken for crop during 1945-48. The breakdown for individual years

which was submarginal for wheat production in the '30's became highly profitable for wheat during the war and the early post-war years. With lower rainfall or lower prices the margin will roll back, but not to the former levels because of the greater efficiency of modern equipment and of improvements in varieties of crops and tillage practices. The Great Plains has fulfilled and probably should continue to fulfill its traditional part in American agriculture—that of being the most elastic and yet unpredictable factor in crop production.

Mechanization has brought a change in the cost structure for both crop and livestock production. A higher proportion of costs now require cash outlays. Increased expenditures for fuel, machinery purchases and repairs, are associated with lower labor requirements. With mechanization, cash costs have become rigid under a given scale of output.⁵

Policy and Program

What is required of a farm program to increase the efficiency of Great Plains agriculture? First, the program must be consistent with the need for production adjustments and flexibility in land use to reach a level of efficient resource utilization. It must not freeze the production pattern in any area. It must encourage shifts in production which will prevent the accumulation of "burdensome surpluses." Second, the program must be one that will increase the stability of production and marketing operations through adapted programs of storage, credit, crop insurance, taxation, and income supports.

Production adjustments In Brannan's original testimony he stated that "the program I have presented is designed to raise the effi-

is as follows. 1945— 667,184 acres

1946— 853,572 acres

1947—1,335,956 acres

1948—1,469,926 acres

See R. I. Throckmorton, "Report of Conditions in the Great Plains as of July 10, 1948," *Proceedings of the Great Plains Council* for July 29, 30, 31, 1948 (mimeographed), pp. 34-39.

⁵ If output is allowed to vary, the cost structure may be more flexible in certain respects than it was prior to mechanization. Evidence is accumulating which indicates that reasonably accurate yield forecasts can be made about the time of seeding which may encourage farmers to alter their scale of operations on a year to year basis to a greater degree than was profitable in former years. See A. L. Hallsted and O. R. Mathews, *Soil Moisture and Winter Wheat with Suggestions for Abandonment*, Kansas Agricultural Experiment Station Bulletin No. 278 (1936) and Ray F. Pengra, "Crop Production in the Semi-arid Regions and Insurable Risk," this *Journal* XXIX (1947), 567-70.

ciency with which resources are used in agriculture." In regard to adjusting agricultural production he said "careful consideration must be given to providing a combination of production and marketing adjustment measures to balance supplies with demand. . . . Marketing quotas and acreage allotments should continue to be available or be provided for such commodities as tobacco, cotton, wheat, rice, corn, and peanuts, with improvements based on experience . . . acreage allotments and marketing quotas should be available for use on other feed grains. . . . The legislation should provide for acreage allotments, marketing quotas and marketing agreements and orders for fruits, vegetables, and tree nuts. . . . The time may come when marketing quotas or similar feasible devices may be desirable for meat animals, dairy products, poultry and eggs, although the need for improving the diets of consumers and for encouraging conservation farming would not so dictate at this time. . . . Eligibility of a producer for participation in the benefits of any price support program should be conditioned on compliance with or adoption of applicable programs of production adjustment, marketing quotas or agreements, and the carrying out of reasonable conservation practice requirements."

Would such a program lead to efficient resource utilization in the Plains? If these regulations are to be the major factors controlling production decisions the answer must be largely in the negative. Administrative controls imposed on acreage would delay the needed adjustments and would destroy the flexibility required for efficient resource utilization. If wheat prices, for example, are maintained by production controls above some point of "normal" market equilibrium and if acreage cuts are made percentage-wise as in the case of the AAA, this would take good land out of production as well as leave land in wheat production which would be submarginal for wheat at the "normal" market equilibrium price. If these regulations are only for standby purposes for emergency use their adverse effect on the efficiency of resource utilization should not be great.

How would Brannan's program lead to shifts in production which will prevent the accumulation of "burdensome surpluses"? The program places emphasis on two price techniques: (1) price supports for storables, and (2) production payments for non-storables. The storables of the Plains are mainly wheat and the feed grains. Commodity loans and purchase agreements, if tied closely to an historical base, might bring the very thing which broke the Farm Board

and which was about to break the price support of the CCC in 1942 before the development of the wheat feeding subsidy program. Apparently in Brannan's plan, wheat prices would be held at some relatively high level regardless of world wheat conditions, of the price existing for hogs and cattle, or of the supply and carryover of wheat and other grains. Wheat could only move into world markets and feed uses with the help of government subsidies. Domestic human consumption of wheat is about half or less than half of the wheat marketed during the past three or four years. While Great Plains wheat farmers probably would like to see wheat prices stabilized at 90 to 100 percent of "parity," it is equally obvious that this is the major thing that cannot be done without some combination of drastic marketing quotas, plus consumption, feeding, and export subsidies.

To the extent that the Agricultural Act of 1948 allows greater price flexibility than the Brannan proposal, it would bring about production adjustments with less administrative control than would be required in the use of Brannan's plan. As a vehicle to achieve optimum resource utilization the price flexibility of the 1948 act is to be preferred; but Brannan's plan should provide a higher level of income and greater income stability. The more desirable feature of each might be contained in a law which provides (1) price flexibility with certainty through forward prices and (2) income stability through direct income payments based on the general index of agricultural purchasing power.

The use of price supports on the basis of whether the products are storable or non-storable would result in greater price certainty for feed-wheat and other feed grains than for livestock; which may cause a shift away from the livestock economy.⁶ Rigid price supports for grains without corresponding and consistent price guarantees for the end products may make feeding operations unprofitable in certain short run periods. A sporadic type of livestock feeding operations might result.

⁶ Because of changes in political complexion, the success of such a program to encourage expansion of the livestock industry may depend on the farm operators' confidence in the Government's fulfilling its commitment to make production payments on livestock and livestock products which offset the feed purchased or produced at high support prices. Many operators had their confidence severely shaken by the unfortunate "80-cent situation" in connection with wheat for foreign shipment in early 1946. Continually changing OPA rules on meat prices and rationing during the war always seemed to the feeder to come after he'd made his purchases of feeders but before he'd sold them. Many feeders became conservative in their operations to reduce their loss potential under this unpredictable market factor.

The support prices proposed by Brannan would depend on historic patterns and after the program had been in operation for a decade or more the level of price support would be based on the previous level of administered prices. In the Plains, where shifts in land use are rapid, price certainty would appear to have a greater effect on the efficiency of resource utilization than in areas where land use patterns are less changeable. It seems important, therefore, that the elements of price certainty which are written into the program should be flexible enough to facilitate shifts in resource utilization in line with market demand. This presents a strong argument for a forward pricing system for all the major marketable products of the Plains.

Conservation. The emphasis which Brannan places on conservation is properly placed but it is unlikely that significant advances in conservation will come through an acreage control program. Rather they should come through farmer-education services and if this does not achieve the degree of conservation considered desirable resort should be made to soil conservation payments for stated operations or practices.

Storage. There is a strong case for storage operations to stabilize the supply of feed grains. The wholesale liquidation of livestock from the Plains region during the drouth of the 1930's is well known. In many cases livestock were sold in extremely poor condition; and in some cases liquidation cut heavily into the foundation breeding herd. Periods of drouth varying in intensity and duration may be expected to recur. What kind of price-storage policy is desirable to provide a cushion against this sort of thing? It appears to be a policy which will permit storage stocks to accumulate during years of good crops and which will encourage their use as feed during years of poor crops. The maximum limit of these stocks as determined by the storage capacity available should be two or three times the current storage capacity in the Plains. This means that farm storage facilities should be expanded especially and that policy for storables should emphasize their use as an intermediate product. Brannan's emphasis on increases in storage capacity seems particularly applicable to the Plains, but in carrying out this policy, stable feed supplies rather than price support should be the major goal.

Credit policy. A basic weakness inherent in the Great Plains settlement pattern—inadequate land resources in the farm unit—

might be corrected in part through credit policy. In recent years some units have increased toward the upper limit for family sized farms due to reinvestment of a large volume of savings. If this trend is considered desirable, to obtain increased efficiency in production, it could be accelerated by placing less emphasis on the owner's equity and more on potential earning capacity—less emphasis on the existing farm unit and more on the goal of the adjusted farm unit. Brannan's suggestion for an "expansion in the Farmers Home Administration" could strengthen or retard this adjustment depending on the objectives to be followed under the expanded administration.

Adequate sources of credit should be available in bad times as well as in good times. In the past some credit sources have competed wildly in periods of prosperity but have left the Plains farmer flat in periods of crop failure or low prices. These policies, whether intentional or not, have contributed in an important way to the boom-bust situation in the Plains. It may not be too much to require that the governmental agency in the credit field also act as a balance wheel.

Crop insurance. Crop insurance, which Secretary Brannan recommends for expansion, fits into the general resource plan. The question of crop insurance does not appear to be one of policy. Rather it is a problem of developing the correct actuarial structure, as outlined elsewhere.⁷ Crop insurance may have the important effect in resource utilization of providing the equivalent of yield certainty. An expanded crop insurance program therefore appears as a necessity in working toward an efficient resource utilization pattern in the Plains.

Income Instability in the Plains

Income instability of the farmer in the Plains arises in the main out of two phenomena: (1) price instability and (2) yield instability. Income instability has been magnified over the past 20 years in the interaction of these two factors since drouth and low prices occurred at the same time in the '30's while bumper crops and high prices have been experienced simultaneously since about 1941 (Table II). These combinations have resulted in a greater aggregate income and in greater variability in income over the

⁷ See "The Actuarial Structures for Crop Insurance," this *Journal*, XXXI 2, 418-448.

20-year period than would have occurred if the highs and the lows in prices and in yields had been in some other combination.

TABLE II. AVERAGE CASH RECEIPTS PER FARM IN THE GREAT PLAINS STATES

State	1925	1930	1935	1940	1945
	(Dollars)	(Dollars)	(Dollars)	(Dollars)	(Dollars)
Montana	2,830	2,020	1,986	2,307	6,899
N. Dakota	3,665	1,908	898	1,718	6,801
Wyoming	3,228	2,880	2,208	3,381	7,489
S. Dakota	3,039	2,301	916	1,649	6,189
Colorado	3,186	2,881	1,625	2,506	7,181
Nebraska	3,483	3,155	1,567	1,853	6,573
Kansas	2,804	2,348	1,380	1,565	5,604
Oklahoma	1,762	897	747	1,052	2,782
New Mexico	1,572	1,586	898	1,687	4,033
Texas	1,653	1,069	831	1,221	3,309
All States	2,346	1,690	1,069	1,502	4,655
(Livestock & Products)	(1,092)	(983)	(632)	(893)	(2,505)
(Crops)	(1,254)	(707)	(437)	(609)	(2,150)

Source: *Cash Receipts From Farming*, Bureau of Agricultural Economics, Washington, D.C. (Mimeographed), January 1946

The income instability of the operator in the Plains varies by type of farm or ranch. All operators are affected by market-price changes but the production stability of the three main types of agriculture—dry-land crops, ranching, and irrigated farming—is markedly different. The dry-land farmer and secondly the rancher are most vulnerable to changing weather conditions whereas the irrigation farmer is the least vulnerable, especially where water supplies are adequate.⁸

Policy and Program

If income instability is to be reduced two elements must come into the picture (1) A type of crop insurance must be developed which can be effective in dry-land and ranching operations. (2) Price stability must be increased or compensatory price payments must be made to counteract some of the price instability. But such payments should be made on the basis of average sales over a

⁸ The rancher's gross income fluctuates less than that of the dry-land farmer (1) because wheat and other grain crops usually are more sensitive in response to variations in the seasonal distribution of rainfall and to small differences in total precipitation than is range grass, and (2) because a dry year is a time of liquidation for the rancher, a wet year is a time for building up his herds, whereas the dry-land farmer who normally has a poor crop in a dry year may have little to sell in such a year. In a season of crop failure a wheat farmer also has to replace his seed.

period of years, rather than on the sales of the current year as under Brannan's proposal, to avoid adding to the income instability caused by variable crop production.

In periods of low agricultural income it is not clear whether agriculture faces a short run cyclical disequilibrium or a long-run secular income disparity. If it is the former the compensatory price payments of the low price years could be balanced by taxes in the higher price years. In the Plains, especially in case of some of the farmers with higher incomes, the assessment of the personal income tax on the peak incomes of some of the past few years may actually work in such a manner. It might be possible to go further in this direction by applying the withholding feature of the general income tax to farm product sales.⁹ Perhaps this might be supplemented with an additional tax which would be levied only in years of high prices.¹⁰ It is not clear how far society should go in this direction but at least payments such as Brannan proposes could be defended more effectively if a definite policy is formulated along these lines.

Real Income and Social Welfare in the Plains

Real incomes of farm families in the Plains differ greatly. Gross incomes in any one year cover wide ranges (Table III). In addition to the wide differences in gross incomes, there is lack of

TABLE III. DISTRIBUTION OF FARMS IN THE GREAT PLAINS STATES
ACCORDING TO GROSS RECEIPTS

Gross receipts (Dollars)	1930		1940		1945	
	Number	Percent	Number	Percent	Number	Percent
0- 2,499	937,208	71 0	1,020,260	87 7	600,509	56 2
2,500- 5,999	250,979	19 0	104,297	9 0	287,393	26 9
6,000- 9,999	45,727	3 3	18,056	1 5	103,458	9 7
10,000-19,999	19,054	1 4	9,546	8	54,660	5 1
20,000 and over	8,233	.6	4,808	.4	21,321	2 0
Unclassified	61,652	4.7	6,729	6	1,235	.1
Totals	1,320,853	100 0	1,163,696	100.0	1,069,076	100.0

Source: United States Census of Agriculture, 1930, 1940 and 1945.

⁹ See Harold G. Halcrow, "Farm Price, Production, and Income Policy," *Proceedings of the Western Farm Economics Association*, 1948, p. 41 and "Analyzing the Tax Load of Agriculture—Discussion," *this Journal*, XXXI: No. 1, Part 2, 680-81.

¹⁰ Cf. Geoffrey S. Shepherd, "A Farm Income Stabilization Program Could Be Self-Financing," *this Journal*, XXX 142-50.

uniformity in the availability and adequacy of public services. Some families are located on all-weather highways close to good schools and large markets, while others are relatively isolated. About half the farms and ranches in the Plains are served by central station electricity. The combination of home and public facilities that may be available to the family in the Plains differs considerably from home to home and from area to area. Some of these differences may be justified on the grounds of just rewards for good management, hard work, and savings; but not all of them can be justified on these or on any other grounds.

Policy and Program

How can real income be expanded and how can a greater social welfare be achieved in the Plains? In focusing attention on aggregate income the question of expanding real income and of increasing social welfare may be overshadowed. Production payments as well as price supports tend to help farmers in direct proportion to their level of output, thus favoring the farmers who already have achieved a reasonably good income position. The problem of rural poverty—in the Plains or elsewhere—cannot be solved alone by price policy, credit, or income payments. These devices may hinder rather than promote the necessary mobility for an expanding real income and greater social welfare. A credit policy with the objective of developing “economic” family farm units, more help for rural education, improved rural health facilities, expanded nutrition and housing programs, more Federal help in providing all-weather farm to market roads, an expansion in rural electrification facilities—all these should receive greater emphasis.

In his concluding remarks Brannan recognized the need for “a program for job training and placement and some definite means of encouraging the development of industries in underdeveloped areas . . . the conservation of agricultural resources . . . an expanded soil-conservation program . . . community services such as electrical and telephone services and health and educational facilities . . . research and education in agriculture and home economics . . . cooperation credit . . . the school lunch program . . .” Also Brannan recognized that his price support program “falls short of meeting the needs of those operators who lack enough good land and enough capital to produce the necessary volume with the necessary efficiency for a good living . . .”

What appears to be called for in the Plains is an expansion especially among the medium and smaller family farms to overcome their land deficiency. In fact it appears conclusive that the only way to achieve a higher real income and greater social welfare among the farm families of the Plains is to increase the mobility of the excess labor resources and to provide employment for these people through industrial development. If this is achieved, the aggregate "cost" of the program to the taxpayer—which is the subject getting the headlines—could be reduced to a minimum in the long run and yet farm families, except the most isolated, could achieve a parity of real income. In the meantime two things should be emphasized. (1) The transition from the war to the peacetime economy should be undertaken with income supports which increase rather than restrict the mobility of labor. (2) The shift toward optimum resource utilization, which is still progressing in the Plains, can be made most easily if administrative controls over acreage and output are reduced to a minimum. In this manner, agriculture in the Plains may achieve a real parity income without looking forward to a long era of production payments.

HIGH LEVEL SUPPORT PRICES AND CORN BELT AGRICULTURE

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IF ANY benefits are to accrue to American agriculture as a result of a farm program similar to that advanced by Secretary Brannan in April of this year, the Corn Belt is in a position to command a large proportion of the benefits.¹ The Corn Belt had something less than 20 percent of the farm population in 1945, and sold roughly 28 percent of the total farm marketings in 1947 and 1948.² With 18 percent of the agricultural labor force, the six states produced 27 percent of the total agricultural income in 1945.³

Any program that will increase farm income by increasing prices will have a "favorable" impact upon a commercial agriculture with a relatively high productivity per labor input.

The economic effects of the Brannan proposals may be considered under two heads—resource effects and income effects. Since part of the resource effects will depend upon the income effects, I shall consider the latter first

Income Effects

The income effects of the Brannan proposals will depend upon the relation between the support levels and the levels that would otherwise prevail in the market. If market prices should be above the support prices, the main impact of the program would be to reduce price uncertainty. I believe this would make the income distribution within agriculture somewhat more equal. The small farmers are subject to a greater degree of capital rationing and are in general somewhat less venturesome. This would make it possible for them to expand the quantity of resources at their command to a somewhat greater extent than the farmers with larger firms.

But I cannot believe that a ten-year moving average of prices, adjusted by the purchasing power of farm marketings, would almost exactly reflect the equilibrium prices for farm products. No

¹ The Corn Belt, as I view it, includes the eastern portions of Kansas, Nebraska, and South Dakota, the southern half of Minnesota, the northern half of Missouri, and all of Iowa, Illinois, Indiana, and Ohio. However, my analysis is based on data for the six states—Minnesota, Missouri, Iowa, Illinois, Indiana, and Ohio.

² BAE, *Net Farm Income Situation*, Jan, 1949, p. 6

³ *Ibid.*, July, 1946, p. 18

one will question that individual product prices will depart from the prices indicated by such a formula. It is also unlikely that the average level of market prices will approximate the average level indicated by the formula. I would guess that after the current heavy export demand for U. S. food subsidies to roughly its pre-war aggregate quantity level, farm prices will be at least 15 percent below the average suggested by Brannan's formula.⁴

How will the income benefits from the Brannan proposals be distributed? Given our general values with reference to income equality, we would like to have the plan make incomes more equal than is now the case. At least this is the criterion I shall use—the plan should reduce the inequality in distribution of income. Three comparisons will be made: (1) within the Corn Belt; (2) between the Corn Belt and other agricultural areas; and (3) between the Corn Belt agriculture and non-agriculture. In general it does not seem that the subsidies will make the distribution of income more equal than it would otherwise be.

The Brannan proposals will have the same effect upon the distribution of income within agriculture as a price increase for farm products.⁵ If the Brannan program results in a 10 percent

⁴ The data on food consumption and relative food prices indicate a gradual yet perceptible decline in the demand for food at retail. With a decline in per capita consumption of about four percent, relative food prices have fallen since 1947. Part of this decline may be temporary, but it is unlikely that retail food prices will be as high in 1949 as they were in 1947. The demand for food from farmers has declined by more than the demand for food at retail. This is as one would expect. Marketing costs have been rising and are not expected to decline. Consequently all changes in food prices at retail will be reflected twice over at the farm level. The parity ratio was 106 for the first quarter of 1949—roughly the level indicated by Brannan's proposal.

We should also consider what has been happening on the food production and utilization side. In 1935-39, exports constituted 2.5 percent of the 1935-39 food utilization. In 1949 it is estimated that military (which includes food for American armed forces) and shipments and exports will require 12.3 percent of the 1935-39 food utilization. Making some allowance for U. S. armed forces personnel, a return to the prewar level of exports would permit about a seven percent per capita increase in consumption from a given level of production. If food production should rise to 140 percent of 1935-39, per capita food consumption could go as high as 118-120, even if exports are twice the 1935-39 quantity.

In any case, it is difficult to visualize a fall in relative food prices at retail of less than 10 percent (from 192 to 119-120) over the next few years. If this occurs, farm prices will fall by about 20 percent (from 262 to 210 if other prices remain constant) giving a parity ratio of roughly 85 percent.

⁵ We do not have empirical data that show exactly what happens to income distribution when only the prices of agricultural products change. Most pertinent data seem to be those showing the distribution of net money incomes of farm families in 1941 and 1947. A rough measure of changes in income distribution between the two periods is the percentage of families having two or more times the median income, and having half or less than the median income. In 1941, 21 percent had an income

increase in farm prices and farm price returns, the income distribution effects within agriculture will be equivalent to a 10 percent increase in farm prices in the market place. If production controls and marketing quotas are imposed upon individual farms in terms of historical bases, the above conclusions would not require substantial modification.

The above comments can be made more vivid by indicating in a rough way how the Brannan proposals would affect the distribution of income. This will be done by showing the final incidence of the subsidy by broad income or size groups of farms.

The following assumptions will be made:

1. Price returns are increased (by the proposals) by 10 percent on all products sold.
2. The distribution of income from sales of farm products is the same as reported by the Census for 1944, and the level of prices without the Brannan proposals would be those prevailing in 1944.
3. The Census classification of farms in Classes I to VII by size, degree of commercialization, and extent of dependence upon agriculture represents a meaningful classification of income groups.
4. Only part of the gross subsidy will be retained by the farmer actually receiving it. Prices paid for factors will be higher because of the subsidy. Class I farms will retain 45 percent; Class II and III, 50 percent; and Class IV and other classes, 55 percent.
5. There is no upper limit on the amount of production payments per farm.⁶

two or more times the median, while in 1947, 20 percent fell in this group. In 1941, 27 percent had half or less than the median income; in 1947, the percentage was 25 percent. (The medians were \$800 in 1941 and \$1963 in 1947). These data would seem to indicate that within agriculture, rising prices increased the incomes of income groups in about the same proportions. Since income earning opportunities off the farm improved, it is not unlikely that higher farm prices—nonfarm wages and job opportunities unchanged—would make the distribution of farm income relatively more unequal. The upper income groups receive a much greater absolute increase in real income than the lower income groups, of course.

Sources of data: *Statistical Abstract, 1947*, pp. 274, and Bureau of Census, Series P-60, No. 5, p. 16.

⁶ Laudable as the objective of fostering the family size farm may be, Secretary Brannan's proposal of limiting the benefit of his program to a total of 1,800 units is hardly workable. Since the price of some products would be maintained in the market-place—corn, wheat, and cotton—farmers specializing in these products would get the full benefit from the proposals. Brannan's proposals would discriminate against large-scale producers of perishable products as compared to the large-scale producers of durable products.

Table I indicates the effects of the proposals on net operator incomes in the Corn Belt. The net subsidy per farm operator on Class II farms—large family farms—is roughly 12 times what it

TABLE I. DISTRIBUTION AMONG FARM OPERATORS OF NET SUBSIDY RESULTING FROM AN INCREASE OF 10 PERCENT IN FARM PRICE RETURNS^a
(Based on 1944 Gross Income Distribution)

State and farm class ^b	No of farms	Farm population	Gross subsidy (millions)	Net subsidy (millions)	Net subsidy per farm	Average value of products sold or used
1	2	3	4	5	6	7
Iowa						
I	6,366	40,190	\$20.4	\$ 9.2	\$1,445	\$32,768
II	49,297	223,031	48.6	24.3	493	10,349
III	87,225	334,538	39.9	20.0	229	5,004
IV	39,804	132,082	6.8	3.7	93	2,021
VI	9,019	25,439	5	3	33	829
Illinois						
I	8,309	57,560	22.0	9.9	1,191	26,979
II	44,245	200,057	40.4	20.2	457	9,522
III	55,724	213,634	24.8	12.4	223	4,808
IV	40,648	133,573	6.6	3.6	89	1,911
VI	16,469	48,062	1.0	6	36	823
Ohio						
I	1,573	16,800	5.5	2.5	1,589	35,606
II	13,164	76,796	12.7	6.4	486	10,098
III	53,256	230,990	23.1	11.6	213	4,696
IV	54,915	201,891	9.1	4.6	84	1,945
VI	23,074	69,129	1.4	0.8	33	833
Indiana						
I	1,888	17,551	6.1	2.7	1,430	33,792
II	15,100	81,593	14.5	7.3	483	9,998
III	45,109	186,079	19.3	9.7	215	4,606
IV	47,461	167,823	7.6	3.8	80	1,881
VI	17,102	51,415	1.0	6	35	808
Missouri						
I	1,569	14,101	6.4	2.9	1,848	41,229
II	9,244	46,073	9.2	4.6	498	10,450
III	46,375	190,595	18.8	9.4	203	4,474
IV	84,946	307,787	12.8	7.0	82	1,874
VI	40,319	123,846	2.2	1.2	30	831
Minnesota						
I	1,351	9,215	4.8	2.2	1,628	36,174
II	15,464	73,622	15.1	7.6	492	10,325
III	77,194	338,864	33.0	16.6	214	4,770
IV	56,429	205,527	9.6	5.3	94	2,053
VI	12,907	37,556	7.9	4.3	33	846

^a Data from United States Census of Agriculture, 1945, *Special Report, 1945 Census of Agriculture*, Table 29

^b Farm Class defined in *Ibid*, p. 16

Class I—Large-scale commercial farms—generally with a value of products in excess of \$20,000. Some farms with a value of land and buildings in excess of \$70,000, and a value of products of \$8,000–\$19,999 were included.

is for Class VI farms—family subsistence farms.⁷ The operator on Class II farms would receive roughly five times as much as the Class IV farm operator—small-scale family commercial farms.

TABLE II AVERAGE SUBSIDY PER FARM FOR OPERATORS IN CLASSES I, II, III, IV, AND VI FOR CERTAIN STATES

	No of farms in Groups I, II, III, IV, and VI	Total net subsidy to Groups I, II, III, IV, & VI (millions of dollars)	Net subsidy to farm operator for the groups (dollars)
Mississippi	212,969	14.6	69
Alabama	151,991	10.8	71
West Virginia	37,700	3.0	80
South Carolina	108,790	9.7	89
Georgia	170,818	15.4	90
Louisiana	94,095	9.0	96
North Carolina	223,220	24.9	117
Missouri	182,453	25.1	133
Texas	271,930	48.5	178
Indiana	126,660	24.1	190
Minnesota	163,345	35.9	220
Ohio	145,982	32.8	225
New York	101,198	25.0	247
North Dakota	66,669	18.3	274
Kansas	120,865	33.6	278
Illinois	165,415	46.7	282
Massachusetts	19,644	5.6	285
Florida	39,244	11.4	291
Iowa	191,711	57.5	300
Colorado	36,942	12.2	330
California	105,235	66.4	631

Source: Calculated from U S Census of Agriculture, *Special Report, 1945 Census of Agriculture*, Table 29

Given the greater proportion home consumption on small as compared to large farms, relative real incomes will probably be increased by the same or greater proportion on the large farms.

Table II shows the estimated average net operator subsidy for the U S and selected states. As one would anticipate, the states

Class II—Large-scale family commercial farms—generally with a value of products of \$8,000–\$19,999

Class III—Moderate-scale family commercial farms—generally with a value of products of \$3,000–\$7,999.

Class IV—Small-scale family commercial farms—generally with a value of products of \$1,200–\$2,999

Class VI—Family subsistence farms—farms with a value of products of \$500 to \$1,999, a value of land and buildings of less than \$8,000, and the farm operator working off the farm less than 100 days in 1944.

⁷ Farms in class II would not be affected by the upper limit referred to in the previous footnote.

with high incomes receive the most. Iowa farm operators dependent upon agriculture for their livelihood would receive more than four times as much as Mississippi farmers; California farmers would receive nine times as much. In general, the Corn Belt would receive much more per farm than the U. S. average.

Would the Brannan proposals reduce any "inequities" in the distribution of income between Corn Belt farm families and families not dependent upon agriculture? There is no evidence to indicate that the farm operator families in the Corn Belt that would receive the bulk of the benefits from the Brannan proposals have had smaller incomes than comparable non-farm families during the last several years.

TABLE III. AVERAGE FARM LABOR INCOME ON ALL FARMS AND SALES NUMBER AND POPULATION OF FARMS IN CLASSES I TO IV AS PERCENT OF THE TOTAL FOR CORN BELT STATES

	Average farm labor income, 1945 ^a	Sales of Classes I-IV as percent of total sales, 1944 ^b	Number of farms in Classes I-IV as percent of total, 1944 ^b	Farm population in Classes I-IV as percent of total, 1944 ^b
Iowa	2,320	99.2	87	90.7
Illinois	1,850	98.0	73	78.3
Minnesota	1,640	97.9	80	85.0
Indiana	1,380	96.0	62	67.6
Missouri	1,290	93.6	56	64.7
Ohio	1,270	94.9	56	61.6

^a Estimate made by author. Data estimate annual average labor income per worker on all farms, not just for farms in Classes I-IV.

^b *Census of agriculture, 1945, Special Report of 1945 Sample Census of Agriculture*, Table 29.

It seems that the Brannan proposals might well result in net farm incomes slightly in excess of the 1945 dollar level of \$16.9 billion implicit in the estimates in Table III.⁸ Farm marketings valued at \$26.2 billion dollars might result in a net agricultural income of \$16.5-17.0 billions, assuming the same level of production expenses as in 1948.⁹ Actually, production expenses would fall below

⁸ These estimates are based upon data given in *The Farm Income Situation*, July, 1946. The national estimates of income and expenses were later revised, but no new state estimates have been provided. On a national basis, the final realized net income from agriculture was \$16.3 billion dollars, or 0.6 billion dollars less than indicated above.

⁹ In 1950, Secretary Brannan estimates, the income support level would be roughly \$26.2 billion dollars. One might assume that if all prices were at the calculated support level, the cash value of farm marketings in 1950 would be \$26.2 billion dollars for a "normal" 1950 crop. But one would be in error in doing this. When

1948 because of the decline in feed and livestock costs implicit in the fall of the value of farm marketings.

As shown in Table I, the bulk of the subsidy will go to farmers in Classes I, II, and III. Assuming that roughly one-half of the gross income is required to meet production expenses, the net average family operator income of the Class III farms in 1944 was roughly \$2,200 to \$2,500, plus the value of the housing. This average income of the lowest of the three classes might be compared with the median family incomes of various non-farm groups in 1947. The median family income for rural non-farm families was \$2,800 in 1947. Families in towns and cities of 2,500 to 49,999 had median incomes of \$3,119.¹⁰ There do not seem to be any important differences between the real purchasing power of the incomes being compared.

If only labor income is compared, much the same result is apparent. In 1947, the average wage of employed industrial workers was about \$2,500. Table III gives the average labor income for *all labor on all farms* as well as certain other data on farms in Classes I to IV compared to the state as a whole. Even without making any adjustment for the low productivity of the farm labor on Class V, VI, and VII farms, the real income of farm labor in Iowa was in excess of employed industrial workers. It seems safe to assume a difference in purchasing power of 20 to 30 percent.¹¹ In Illinois, the case also seems to be fairly clearcut—the average real labor income on farms in Classes I to IV would be equal to or in excess of \$2,500 based on urban purchasing power.

Some further examination of the Ohio data is required: it is safe to assume that Classes I–IV will have 95 percent of the total labor income and probably not far wrong to assume that 70 percent of

farm production is rising, the quantity of marketings will be higher in any given year than in the previous 10 years, random fluctuations in output aside. For 1940–49, the average level of farm production for home consumption and sale was about 126. In 1947 this index stood at 137. If the index were 137 in 1950, the price supports implicit in Brannan's proposals, under the assumptions indicated in his speech of April 7, 1949 before the House and Senate Agriculture Committees, would result in cash receipts from farm marketings in excess of \$3.5 billion dollars. This is due to the fact that the Brannan proposals use the average level of marketings for the previous decade to arrive at the level of support prices.

¹⁰ Department of Commerce, Bureau of Census, *Current Population Reports*, "Consumer Income," Series P-60, No. 5, p. 15.

¹¹ See Nathan Koffsky, "Farm and Urban Purchasing Power," in *Studies in Income and Wealth*, Vol. XI, (National Bureau of Economic Research, 1949), pp. 156–178.

the labor was employed on these farms.¹² This adjustment would give a net labor income somewhat in excess of \$1,700. On an urban purchasing power basis this is roughly \$2,100 to \$2,300. The Missouri and Indiana labor incomes on farms in Classes I to IV would be slightly higher.

There is a real question whether Class IV farms should be included in the calculations. In Ohio, for example, about 77 percent of the total subsidy would go to farms in Classes I, II, and III, while only 17 percent would go to Class IV farms. Yet Class IV farms are 81 percent as numerous as Classes I-III, and have 62 percent as many people living on them. If Class IV farms were eliminated from the calculation of labor incomes, casual observation indicates that the average labor income of the included groups would rise above \$2,500, measured in urban purchasing power.

The proposal that we have been analyzing cannot be considered as one furthering income equality in terms of its impacts upon the Corn Belt. Within the Corn Belt, the high income farmers would receive much more than the low income farmers. The relatively well-to-do Corn Belt would receive much more from the program than the poorer agricultural areas. And there is no evidence that the labor on the farms which would receive three-fourths or more of the total subsidy within each state have lower real incomes than individuals of comparable skills in other occupations under the economic circumstances implicit in Secretary Brannan's proposals.

Some comment on the functional distribution of income is in order. In the short run, one might anticipate that the broad factors of production—land, labor, and capital—would gain in roughly the same proportion and by perhaps slightly more than the increase in gross agricultural income. In the longer run, it seems likely that the least mobile factor (most inelastic supply) would gain the most. In the case of Corn Belt agriculture, this would be land. This will mean that a disproportionately large part of the subsidy would go to current owners of land. And I can think of no good reason why the present owners of land should be so aided.

Resource Effects

It was argued earlier that the Brannan proposals would result in

¹² The 1945 Census of Agriculture does not estimate labor use by value of product groups or by the Classes used here. Estimate for Ohio is a rough estimate based on data on population and cash wages paid and data for East North Central States from the 1940 Census of Agriculture.

support prices at least 10 percent—perhaps 20 percent—higher than the market prices would be. Presumably this would be true only for a time; in seven or eight years the formula should catch up. But will it? I don't believe so, if the Brannan program is carried out to guarantee 100 percent of the support standard. Not only will the formula not catch up, but in the process of "trying to catch up" it will result in a serious misuse of agricultural resources in the Corn Belt.

The most important relative agricultural prices in the Corn Belt are the feed-livestock ratios. Next most important are the ratios of one livestock product to another. This discussion will be limited to the former.

Secretary Brannan wishes to support the main feed grains, particularly corn, by the use of loans and purchase agreements. Assuming sufficient storage space is available, the support price for corn will thus change in response to only one factor—change in the index of prices paid.¹³ Changes in the demand for or supply of corn will not affect its market price and consequently cannot affect its price support level. This is hardly what one would expect in a formula that "will keep price relationships among commodities on a moving, up-to-date basis."

There is no easy answer to this basic dilemma of using supported prices in a formula to determine the level of future support prices. One might argue that production payments on corn is the answer. In one sense it is. If production payments were made on corn, stocks would not accumulate, but two other things would happen. The corn farmer would get the benefit of two subsidies on his corn, and the cost to the government would be very high indeed. If there were no storage program for corn, the price of corn (for an average crop) would reflect the support prices of the livestock prices. This would keep the market price of corn high and there would be only a gradual diminution in the support price for corn. Under the assumptions we have made, however, during the first decade or more of the program, corn producers would receive the benefit of the subsidy to livestock directly in the demand for corn, thus maintaining the market price of corn for insertion in the formula, and a subsidy to make up the (small) difference between the market price and the support price.

¹³ This is a slight understatement. If the quantity of farm products marketed is changing through time, the "multiplier" in the formula will be changed slightly.

I can but conclude that one of the worst features of the Brannan proposals is the method of calculating support prices. This method, when combined with the high level of supports, is completely unworkable if the criterion of economic efficiency is given any consideration. The formula used for calculating relative support prices is workable—and then only in a limited sense of the word—if the support prices are almost always below market prices. The above argument is in addition to any consideration of the effects of using price relationships for the past 10 years as a guide to future production.

The Corn Belt has achieved a relatively favorable resource position. There does not appear to be any considerable excess of resources. The Brannan proposal, if operated over a period of years, would only result in worsening the resource position. It would encourage resources to stay in agriculture which might otherwise find employment elsewhere. If a depression should come or the Brannan program fall into disrepute and be abandoned, the Corn Belt agriculture would find itself with excess resources that should have found employment elsewhere. Farm incomes would then be lower than would otherwise be the case.

The attraction of additional resources into Corn Belt agriculture could be avoided only by stringent production controls. If the production controls were really effective, then much of the income transfer to agriculture would result in higher land prices. A significant subsidy to the present land owners would occur. Is this a group warranting an income grant?

General Criticisms

Anyone familiar with the Corn Belt and the other prosperous areas of agriculture must seriously question the need for any scheme designed to maintain farm prices above "free" market levels during periods of high levels of employment in the economy. What objective does such a program achieve? It obviously worsens resource use by stemming the desirable resource adjustments that such areas as the Corn Belt are capable of making when resources are fully employed in the economy. *Do we, as a nation, wish to say that everyone employed in agriculture in 1949 is entitled to roughly the same real income as he earned from 1940 through 1949 and that he is to be permitted to earn that income in agriculture?* Unless we as a nation wish to restrict entry into agriculture, we will also try to

give anyone who wishes to engage in agriculture an economic opportunity of the same sort. In permitting entry, most of the income gains of those in agriculture when the program started would be dissipated, except in the case of land owners.

The most serious limitation of the program is its failure to tackle the problem of poverty. Despite the generally high level of incomes in the Corn Belt, there are tens of thousands of farm families with relatively meager incomes. Not only does a high level support price program fail to meet the needs of low income families, but the cost of the program is likely to be so great that it will preclude Congress' taking any action to meet the problems presented by low incomes in agriculture.

NOTES

RETAIL VALUE OF MEAT CONSUMPTION RELATIVE TO CONSUMERS' INCOMES AS A MEASURE OF DEMAND FOR MEAT

IN THE art of presenting economic facts, there is merit to devices that simplify complex subjects. A method for illustrating fluctuations in demand for meat has gained some acceptance in the field of livestock commodity analysis because it qualifies as a useful simplification of a difficult concept. The method requires only two statistical series—the calculated retail value of all meat consumed and disposable personal incomes. It is much more easily presented than multiple correlation analysis, to which it is akin. It admittedly has a weakness in that all subtleties in its construction and meaning are disregarded. However, this may not be such a harsh criticism, for if all methods of presentation having no deficiency were to be eliminated, economists would be crippled indeed in their task of generalizing in an understandable way on economic events.

Explanation of Method

The retail value of meat consumption is simply the product of the retail weight of consumption multiplied by the average retail price. It is first worked out for each of the four meats. Consumption of each meat by the civilian population is officially estimated by the United States Department of Agriculture. For the purpose here, it is expressed in per capita terms. It is also converted to a retail weight, by means of standard percentage factors which approximate the difference between retail weight and the carcass equivalent (wholesale) weight in which original consumption data are published. The average retail price of each meat is the estimated composite average price for all products as computed by the Bureau of Agricultural Economics from the retail prices by cuts reported monthly by the United States Bureau of Labor Statistics.

The retail value of meat consumption is an imputed valuation rather than a measure of consumers' expenditures for meat. Much meat is consumed at other than the urban retail prices reported by BLS. That consumed by institutions and the military services generally moves at less than a retail price. Hotels and restaurants also buy their meat at prices lower than retail, but their clientele in reality consumes meat at prices per pound that are far higher than

retail prices. The average price of meat bought by rural consumers may be somewhat different from the urban retail price. There are many additional examples of consumption of meat purchased at other than urban retail prices.

The disposable incomes of consumers is a series issued by the United States Department of Commerce. It relates to all personal incomes as corrected for immediate tax obligations. Incomes also are converted to per capita values.

Comparisons of retail value of meat with consumers' incomes have been made for annual data beginning 1913, and for quarterly data beginning 1947. Quarterly calculations employ a seasonal correction for all basic quarterly data—price and consumption of meats, and disposable income. Quarterly comparisons make possible a nearly up-to-date commentary on changes in demand for meat; their usefulness is believed to outweigh the possibility of more error due to the factored corrections for seasonal variations. Indexes of seasonality in consumption and price of meat are only approximate.

Current Results

During the interwar (1922–41) period, retail value of meat consumption averaged about 5.6 percent of disposable personal income. This percentage was exceeded somewhat in the early 1930's especially in the drought years, but in 1941 it dropped to 4.9 percent (Table I). Low prices for pork were the main factor in the low percentage of 1940–41. Comparisons of retail values for the war years have little meaning but the high percentages just after the war—6.3 in 1947 and 6.1 in 1948—testify to the high prices for meat in those years, even in relation to the record-high incomes of consumers. Quarterly data indicate that in the second quarter of 1948, the percentage rose to 6.5. But in the fall months of the year, prices of meats and of livestock fell rapidly. These price declines were greater than can be accounted for by the increase in production or by any seasonal factors. The percentage ratio of the value of meat consumption to incomes slipped to 5.6 percent in the fourth quarter of 1948. In the first quarter of 1949, when prices of meat gradually steadied, the percentage dropped off 0.2 points more, to 5.4. This is 10 percent below the index for the first quarter of 1948. Preliminary data indicate a small increase in the second quarter of this year.

TABLE I. RETAIL VALUE OF MEAT CONSUMED COMPARED WITH DISPOSABLE PERSONAL INCOME BY YEARS, 1925-48, BY QUARTER YEARS 1947-49

Year	Average retail price of meat per pound ¹	Retail value of meat consumed per person ²		Disposable personal income per person ³		Retail value of meat as percentage of disposable income
		Value	Index numbers, 1935-39=100	Actual	Index numbers, 1935-39=100	
	<i>Cents</i>	<i>Dollars</i>	<i>Percent</i>	<i>Dollars</i>	<i>Percent</i>	<i>Percent</i>
1925	30 0	36 3	124.7	627	123	5 8
1926	31.1	36.9	126.8	641	126	5.8
1927	30 5	35.6	122 3	635	125	5 6
1928	31 5	36.1	124 1	644	126	5 6
1929	32 7	37 8	128.2	673	132	5.5
1930	30.8	34.6	113 9	595	117	5 8
1931	25 6	29.1	100 0	505	99	5 8
1932	19 5	22.3	76 6	381	75	5.9
1933	17 5	20.7	71.1	358	70	5 8
1934	20 9	25 9	89 0	406	80	6 4
1935	28.0	28 2	96.8	453	89	6 2
1936	26 7	29.8	102 3	513	101	5 8
1937	28 9	31.3	107.5	549	108	5 7
1938	25 5	27 9	95.8	501	98	5 6
1939	24 6	28.4	97.6	533	104	5 3
1940	22.9	23 4	97 6	570	112	5 0
1941	26 8	33 3	114.4	686	135	4.9
1942	31.4	37.9	130 2	858	168	4 4
1943	31.9	40 8	140 2	953	188	4 3
1944	30 2	40 7	139.9	1,048	205	3.9
1945	30.2	37.9	130.2	1,064	209	3 6
1946	38.4	51 4	176 6	1,120	220	4 6
1947	56 2	75 4	259.1	1,198	235	6 3
1948	62 7	79 4	273 2	1,307	256	6 1
1947						
1st quarter	—	18 0	247 9	295	231	6 1
2nd quarter	—	19 0	261 0	291	228	6.5
3rd quarter	—	19 1	262 4	301	236	6 3
4th quarter	—	19.3	263 7	310	243	6 2
1948						
1st quarter	—	19 0	261 6	314	246	6 1
2nd quarter	—	20 9	287 0	323	253	6 5
3rd quarter	—	20 6	283 0	332	260	6.2
4th quarter	—	18.9	259 9	336	263	5.6
1949						
1st quarter	—	17.9	246.5	332	260	5.4

¹ Weighted average of retail prices for all important cuts.² Computed from estimated retail weight of each meat consumed per civilian consumer. Quarterly data seasonally adjusted, with quarterly indexes converted to an annual rate.³ Computed from income data of U. S. Dept. of Commerce 1929-49 Estimates for 1925-29 by Bureau of Agricultural Economics. Quarterly data seasonally adjusted.

As data for 1949 are a little below the 20-year average percentage, it might be said that demand for meat is "back to normal." Certain it is that the postwar premium prices have disappeared for meats as completely as for late-model "used" automobiles. Even though present prices of meat in cents per pound are still much higher than those before the war, these comparisons suggest that they are not far out of line with present supplies of meat and incomes of consumers.

Theoretical Significance

Unfortunately for economists, a comparison of retail value of meat with incomes has only limited forecasting value. It depends upon an extraneous factor—the size of consumers' incomes—which is itself hard to estimate. Moreover, percentage ratios to incomes have varied considerably about their average level in the past and may do so again. But in spite of these reservations, the method has a certain restraining function in forecasting, for it makes possible a matching of price forecasts against assumed levels of meat supply and of incomes, to show whether the forecasts imply a constant or a varying demand for meat. Furthermore, it can be extended to an evaluation of market prices of live animals, by use of average wholesale and retail margins, thereby completing a simultaneous examination of prices to farmers for livestock, retail prices of meat, and incomes of consumers.

The current "normal" relationship between value of meat consumption and personal incomes carries no certain assurance for prices of meat and livestock in the immediate future. But as it shows that the 1947-48 premium for meat is now gone, it inspires more confidence about future prices than did the high ratio of 6.5 in the spring of 1948.

A direct comparison of the retail value of meat consumption with consumers' disposable incomes is equivalent to a multiple-correlation analysis of the composite average retail price of meat on the quantity of meat consumed and disposable personal incomes. The corresponding analysis would have fixed lines of regression: that of price to quantity consumed would be curvilinear, with slopes such as would yield a constant value for all quantities of consumption (unit elasticity of demand); and that of price to consumers' incomes would be a straight line of a constant percentage ratio. That these are the built-in relationships is clear from the nature of

the value-and-incomes method. Any particular percentage ratio (e.g., 5.6) that may be considered average or normal carries with it the unexpressed assumptions that retail value would be the same for various sizes and composition of the meat supply, and that consumers as a group tend to allot nearly a constant percentage of their income to meats regardless of the aggregate size of that income.

Correlation analyses for the 1922-41 period result in a regression of retail meat prices on disposable personal income not greatly different from that implied in the retail-value methodology. The regression on meat consumption was somewhat inelastic. Thus their inherent assumption of unit elasticity may cause ratios of retail value to disposable personal income to tend slightly above average when supplies are scarce, and below average when supplies are abundant.

A comparison of retail values and incomes has the character of a regression analysis in another respect. Most regressions have some residual deviations, which are often explained away as caused by factors not included in the analysis. In the retail value comparisons, the deviations or departures from average ratios are brought to the fore and given emphasis. Thus we say that retail values were higher than average in 1948 but about average thus far in 1949. Neither the income device nor a correlation explains *why* prices and values of meat are sometimes high or low relative to incomes; each only brings out the fact of their departure from the average relationships.

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THE WORK OF THE PERMANENT AGRICULTURAL COMMITTEE OF THE INTERNATIONAL LABOUR OFFICE

PERSONS engaged in professional fields of agriculture, as well as farmers themselves, may be interested in a brief statement about the work of the Agricultural Service of the International Labour Office. The focus of attention on the United Nations and some of its new instrumentalities, such as the Food and Agriculture Organization, UNESCO, etc., has tended to obscure the fact that the I.L.O. is not only the oldest international mechanism with a continuous existence, but is still a vital one.

The International Labour Organization¹ was established in 1919, a product of the peace settlement after World War I. It is now one of the agencies of the United Nations. Its objective as phrased by the late John G. Winant, wartime ambassador to the Court of St. James and former director of the International Labour Office, is: "to secure social justice in the nations of the world. . . . In its conception it was based on the assumption that social justice is necessary if we are to look forward to universal peace. . . ."

"The approach of the I.L.O. has been to resolve problems rather than to engage in conflict, and its method is through conference, research, and cooperation."²

Although the I.L.O. in its very early period gave some attention to the problems of agricultural labor, its primary concern was with labor in industry. It was not until 1935 that the International Labour Conference approved the formation of a permanent agricultural committee. This committee was organized in 1937 and held its first session at Geneva in February, 1938.³ Following the usual pattern of I.L.O. committees, it consisted of representatives of governments, employers, and workers and so-called agricultural experts, along with representatives of international bodies dealing with social problems in agriculture, and certain members invited by the officers of the governing body to attend particular meetings.

The agenda of the first session, fixed by the Governing Body, consisted of the following items:

1. General discussion of problems of agricultural labor and their relative importance.
2. Protection of child labor in agriculture.
3. Holidays with pay in agriculture.
4. Technical study on hours of work in agriculture.

It was intended that another meeting of the committee would be held in Geneva in September of 1938, but the disturbances in Eur-

¹ The official name of the organization. The International Labour Office is the administrative organ of the International Labour Organization. The International Labour Conference is the highest authority and consists of national delegations, composed of two government members and one delegate each of management and labor. The Conference ordinarily meets once a year. The Governing Body functions as an executive council, meeting usually four times a year. It is elected by the Conference at three-year intervals and consists of thirty-two members.

² From a foreword to *What the International Labour Organization Means to America* edited by Spencer Miller, Jr. Columbia University Press, 1936.

³ The report of this session was published by the International Labour Office under the title, *Social Problems in Agriculture*.

rope made postponement necessary, and the outbreak of war prohibited further meetings until the second session was convened in Geneva in August, 1947. The agenda for this session consisted of the following items.

1. General survey of developments since the first session of the committee, and discussion of the order of priority for consideration by the committee of problems of agricultural labor.
2. Minimum wage regulation in agriculture.
3. The medical examination of children and young persons for fitness for employment in agriculture.
4. Security of employment and occupation in agriculture

A call went out from Geneva on March 15, 1949, to convene the third session of the committee in August or September of 1949. The agenda as approved by the Governing Body is as follows.

1. Hours of work in agriculture.
2. Medical examination of children and young persons for fitness for employment in agriculture.
3. Security of employment and occupation in agriculture.
4. Extension of Social Security to the agricultural population.

The reason some items recur in the agendas is that they were given only preliminary discussion in a previous session, and were brought up in subsequent sessions for final disposition. Some of the items may be retained for consideration in several sessions.

The I.L.O. seeks to implement its program through submitting to its member governments Draft Conventions regarding labor. If and when a member country ratifies such Conventions, it assumes the obligation to bring its legislation into line with the Convention's provisions. For example; a Convention which sets up standards for working conditions of women and young workers, when ratified by the member countries becomes, in effect, an international treaty on this problem. The general result is to provide uniform standards throughout the countries of the world and place them on a more nearly competitive basis, and, of course, to raise the level in countries whose standards previously were low.

The importance of attempting to do something in the field of agricultural labor throughout the world is underscored by the fact that upwards of two-thirds of the workers of the world are engaged

in agriculture. At the same time, the wide variation in agricultural conditions in various countries presents problems of almost insurmountable difficulty. This diversity was spotlighted in the 1947 session of the committee. The representative from the United Kingdom called attention to the fact that all of the standards being discussed had already been achieved in his country; while the representative from India could hardly conceive of their application in his country in the foreseeable future. Minimum wages, holidays with pay, the elimination of child labor, medical examinations for children entering agriculture, and the extension of social insurance to agricultural workers seemed to the Indian representative to be largely academic considerations. Even in the United States and Canada there will be much controversy over many of these measures, and it may be a long time before some of them are adopted, some may never become part of our systems. In short, some policies readily adaptable to certain countries are often not practicable in others. However, the general goal of improving the working conditions and the level of living of people who are engaged in agriculture is admittedly a worthy one, however difficult may be its attainment.

As the present representative from the United States on the Permanent Agriculture Committee, the writer has felt the need of some means of closer articulation between the committee and the agricultural people of the member countries. Obviously, any measures agreed upon for submission to the Governing Body and Conference, and perhaps ultimately submitted to the member nations, must have some practical relation to the conditions in those countries, and a basis in public opinion for their ultimate adoption. There is no way, at present, by which the committee members, themselves, can influence public opinion except through their limited personal efforts. Of course, no country is bound by its membership in I.L.O. to adopt any of the conventions that may be submitted to it, but it is bound by its agreement to have its treaty-making body consider such conventions. Three agricultural items will appear on the agenda of the thirty-third session of the International Labour Conference to be held in 1950. The Conference is the body which makes the final decision on Conventions to be adopted and submitted to the member countries. These items are: (1) General report on agricultural labor problems; (2) Minimum wage-fixing machinery in

agriculture; (3) Holidays with pay in agriculture. If either is adopted as a Convention by the Conference, it will come before the Senate of the United States for consideration. If the Senate should ratify it, appropriate legislation to implement it would be passed. Such is the procedure. Obviously, public opinion will determine the fate of such proposals.

One serious shortcoming in the composition of the Permanent Agricultural Committee at the present time, particularly as regards the United States and Canada, is that there is no representative of agricultural labor, nor of agricultural employers. Dr. John F. Booth of Canada, and myself from the United States, are the sole representatives. The fact that collective bargaining has never been a significant feature of agricultural employer-employee relations in these countries, and that neither labor nor employers are organized for this purpose, makes it extremely difficult to find authoritative spokesmen for either. Who is there, for example, to speak for the sharecropper, the migratory worker, the hired hand, or for the cotton planter, the cane grower, or the corn belt farmer?

Finally, it should be pointed out that very little research has been done in these countries on farmer-worker relationships. There is critical need for the study of attitudes of both groups regarding the adoption of uniform standards and for knowledge concerning the existing practices in various types of farming areas. It is impossible to consider intelligently the problems of agricultural labor without possessing a great deal more information than is available at the present time.

A final comment is in order. The Committee as presently constituted is a transitional one, composed of several of the original members (Booth and myself among them) and this forthcoming session will be the final one for it. A new committee will then be organized, which presumably will be more widely representative, both of member states and of economic groups. It is to be hoped that the problems of labor in American agriculture will be studied more intensely in the future, in order that we may have a more substantial base in factual information for the discussion of labor policy.

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WHAT IS THE BASIS OF FARM FINANCIAL PROGRESS?

WHAT are the circumstances which make it possible for one farmer to accumulate a considerable estate during his farming life time while a neighboring farmer accumulates little? Is it because the one farmer started with more money, or because his farm is larger? Does it make any difference how deeply he had to go into debt when he bought his farm? Just what is the basis of farm financial progress?

A study of farms in Arland Township, Barron County, Wisconsin, made in 1939 and 1946 may hold some leads to the answers to these questions. Arland Township was chosen for the study of farm financial progress because it was representative of rural areas of the northern cut-over region of the Lake States. There was considerable delinquency in the repayment of farm mortgages in this area in 1939 and Federal Land Bank holdings were increasing. All the farmers of the township who could be located and interviewed, a total of 139 farmers, were visited. Interviewers asked about such things as tenure status, individual family history, current farm income, debts, savings, size of farm—anything that might throw light on the question of why one farmer made money and another did not. A repeat study was made of the same area in 1946.

Description of Area Studied

There are no villages or trading centers in Arland Township. A cheese factory, now closed, was situated across the highway on the west side of the township and several trading centers are within a 10-mile radius of its center.

Dairy cows supply the major part of the farm income in this area. The soil is fair to good for the production of feed crops. No cash crops are grown. The southeastern part of the township has some sandy soil while much of the remainder of the cropland is sandy to silt loam. A gently rolling topography characterizes the northeast and northwest corners of the area. Along the Hay River which flows directly south just west of the middle of the area is a fairly narrow strip of rough land.

The township was completely settled by the turn of the century. Records show that the last farm was homesteaded in 1899. At this time practically all farmers were owner-operators. Some farms

were operated by tenants soon thereafter, however, and by 1938, 20 percent of the farms were renter operated. Farm tenancy remained fairly constant from then to 1945 when 18 percent of the farms were operated by renters.

The time of purchase by the present (1938) owner-operators was fairly evenly distributed over the period from 1900 to 1938. (Table I)

TABLE I PRESENT OWNERS BOUGHT AT DIFFERENT TIMES

Year bought	Number of farms	Average crop acres	Net worth		Cost of farm when bought
			When farm was bought	In 1938	
1905	21	64	\$1,055	\$6,328	\$1,751
1906-1913	17	60	2,437	4,659	4,590
1914-1921	28	52	2,105	3,151	4,847
1922-1929	20	41	2,373	2,902	5,108
1930-1937	25	45	1,010	1,788	3,766
All Farms	111	52	\$1,759	\$3,681	\$4,025

The average net worths of the owner-operators at the time they bought their farms increased from \$1055 for the 21 farmers who bought their farms around 1900, to \$2373 for the 20 farmers who acquired farms in the eight-year period of the 'twenties. The group of 25 men who bought their farms during the depression period of the 'thirties were worth only \$1010 at the time they bought their farms. It also may be stated that whereas the initial net worths of the new owners doubled between 1900 and 1938, the average value of the farm purchased increased three times, and the mortgage assumed went up nearly four times. The owners who bought during the 'thirties were worth no more than those who bought in 1900 yet the cost of the farm bought had more than doubled.

Size of Farm Important Factor

These records showed a definite correlation between the size of the farm and the operator's financial success (Table II). As the size of the farm purchased increased, the net worth of the farmer at the end of 15 or 20 years increased both absolutely and relatively. For instance, as the size increased from an average of 29 crops acres to 89, the average net worth of the operator in 1938 increased from \$2394 to \$5995. This represents an increase in net worth of 75 percent for the group of smallest farms from the time the farms

were bought to 1938; and an increase of 166 percent for the 24 large farms over the same period.

TABLE II. RELATION OF SIZE OF FARM TO ACCUMULATED NET WORTH

Size of farm (crop acres) Range	Average	Number of farms	Net worth	
			When farm was bought	1938
0-39	29	41	\$1,865	\$2,394
40-69	52	44	1,907	3,567
70	89	26	2,258	5,995
All Farms	52	111	\$1,759	\$3,681

Additional evidence of the importance of the size of farm is shown in Table III. Farmers who bought the larger acreages of crop land had greater material accumulations in 1938 than the small farmers, whether they had small or large net worths at the time of purchase. The farmers in each of the net worth groups who bought the larger farms had greater net assets in 1938 than those who bought the smaller farms. There is no known reason, however, why relatively large initial net worths should be a handicap to accumulating assets over the years as might be inferred from the group of farmers with the largest initial net assets.

TABLE III. RELATION OF NET WORTH AT TIME FARMS WERE BOUGHT AND SIZE OF FARM BOUGHT TO ACCUMULATING ASSETS

Net worth when farm was bought		Number of farms	Net worth in 1938
Range	Average		
0 to \$999	\$ 346	41	\$3,106
16-39 crop acres		15	2,379
40-69 crop acres		18	2,743
70+ crop acres		8	5,420
\$1,000 to \$2,999	\$1,705	50	4,188
16-39 crop acres		21	2,717
40-69 crop acres		18	4,702
70+ crop acres		11	6,022
\$3,000+	\$5,234	20	\$3,669
16-39 crop acres		5	1,153
40-69 crop acres		9	2,970
70+ crop acres		6	6,696
All Farms	\$1,759	111	\$3,681

These tables clearly demonstrate the importance of the income-producing capacity of the farm as determined by its size. It would seem that if a farmer would be a financial success, his first consideration should be to buy a farm of sufficient size to support a large volume of business. Farm expenses usually do not increase as rapidly as income with the larger farm, and family size and living costs bear little relation to the number of crop acres on the farm. The size of the farm is important in accumulating assets because of the opportunity for greater current farm income.

The history of those operators who were renting farms was the same as for the owner-operators. In 1938 the six renters who had rented the largest farms had accumulated an average of \$2,557 in net assets, while the eight who rented the smallest farms showed an average of only \$759 net worth. The 14 farmers with the medium sized farms averaged \$1,321 net assets.

Management Ability Also Vital

Perhaps the second important factor in financial success is the managerial ability of the individual farmer. Even within each farm-size group the range in net cash incomes was large. The net cash income in 1938 of the small farm group varied from \$143 to \$915 for individual farmers. In the medium farm group it ranged from \$271 to \$1,028; in the large farm group, from \$332 to \$1,311; and those farmers with the largest debt load were not the same as those with the smallest net cash income. The range in the abilities of the farmers to organize and operate their farms very probably accounts for much of the variation within each farm-size group, because the productive capacities of soils were practically identical for the various groups of farms.

Large Initial Debt Not Prohibitive

Another of the factors which might conceivably influence the farmer's financial progress is the debt load he assumes when he buys his farm. There has been considerable speculation concerning the wisdom of the federal government policy during the past years of increasing farm ownership through 100 percent loans. Is that too heavy a load for a farmer to overcome?

Of course it is recognized that the 100 percent loans made during the past decade have much better chances of being paid off than if the loans had been made during times of more nearly normal price

relationships, but this study would seem to indicate that it is not unreasonable to expect farmers to pay out on 100 percent loans even during normal times. Such heavy loans of themselves need not represent insurmountable handicaps to owner-operators.

Nearly 21 percent, or 23 of the 111 owner-operators in 1938, assumed 100 percent loans on their farms at the time of purchase. The chronological distribution of the purchase of these farms was quite uniform over the period covered by this study so that a wide range of farm prices was represented. Only 40 percent of these farms were bought either from the parents or other relatives, in comparison with approximately one-third of all farms of the area. This indicates that most of these loans were not family affairs but strictly commercial loans, made with the expectation of being paid off.

The organization of these farms was not different from that of other farms of the area. Cropping systems were similar and both groups depended upon the dairy herd for the major portion of their income. Outside sources of income played a minor part in the income of both groups, and the volume of business for each group in 1938 was approximately the same. The farms bought were no larger than those bought by neighbors during the same time, and these farmers started with smaller net worths when they bought their farms. Yet the 23 farmers who started with 100 percent loans are making out as well as purchasers with large equities at the time of purchase. They had accumulated an average net worth in 1938 of \$3,742, as compared to an average of \$3,681 for the total group of 111 farms.

There is no source of information that would indicate what proportion of farmers with 100 percent loans dropped out before 1938. Neither is it possible to determine whether the survivors lived more "austerely" than did those with relatively smaller debt loads. But this study shows that those farmers still on farms in 1938 who started with 100 percent loans succeeded in saving as much from their current incomes as the other groups, and by 1938 had accumulated savings comparable to the others.

The question might be raised as to whether the absolute size of the debt load might not be more important than its relative size in influencing the accumulation of net assets. This would seem to have some validity. According to this study (Table IV) those farmers who had the smaller absolute debt load accumulated somewhat

more assets over the years than those with the larger debt loads even though the average size of farm for the different levels remained partly constant.

TABLE IV. RELATION OF AMOUNT OF DEBT AT TIME OF PURCHASE TO NET WORTH

Debt load		Crop acres	Number of farms	Net worth	
				When farm was bought	In 1938
	\$ 0	32	8	\$1,484	\$2,685
	0	50	8	2,915	4,388
	0	85	7	1,532	8,581
Average	0	53	23	\$1,975	\$4,937
1-1,500	885	22	11	948	2,373
	722	52	7	1,089	4,385
	922	82	4	2,176	4,691
Average	837	42	22	\$1,158	\$4,212
1,501-3,000	2,440	31	12	1,485	3,129
	2,267	49	10	1,245	4,092
	2,545	99	6	3,240	4,810
Average	\$2,401	52	28	\$1,775	\$3,833
3,001-4,500	3,867	35	7	2,605	838
	3,712	51	8	1,142	1,887
	3,625	86	4	1,557	3,557
Average	\$3,751	53	19	\$1,769	\$2,331
4,501-	4,995	35	2	175	2,390
	6,310	54	11	2,999	1,776
	6,793	87	6	2,336	3,979
Average	\$6,324	62	19	\$2,466	\$2,746
All Farms	\$2,496	52	111	\$1,759	\$3,681

As the debt load was increased from nothing to \$4,500, the accumulated net worth in 1938 decreased from \$4,900 to \$2,700. However, the increase in net worth with the smaller debt was not proportional to the difference between the debt loads. Another interesting observation was that the group of 19 farmers whose debt load was between \$3,000 and \$4,500 when they bought their farms had a smaller average net worth in 1938 than the group of 19 farmers with initial debts of more than \$4,500—the two groups averaging \$2,331 and \$2,746 in net worths respectively.

The debt load is not correlated with size of farm in this area. Both small and large farms were bought in each debt group. Accumulated net worths were greater within each debt group for those farmers who bought the larger farms. No matter whether the debt at the time of purchase was zero or \$6,000, the farmers who bought the larger farms accumulated from two to four times as many assets as those who bought the smaller farms. Larger debts apparently do not slow up the process of asset accumulation to any extent when associated with large enough farms.

Initial Assets Play Minor Part

Operators who start farming with greater net assets are presumed to have a better chance of making good than those who start out with less. This study would seem to indicate, however, that this time-honored assumption does not necessarily hold, i.e., that larger initial net worth of itself will account for greater assets 20 years later (Table III).

Twenty of the continuous owner-operators in the 1938 study had net worths in excess of \$3,000 at the time they bought their farms—their average was \$5,234. Twenty years later, their average net worth was \$3,669, a drop of 30 percent during the period.

Fifty operators entered farming with net worths between \$1,000 and \$2,999—average \$1,705. A generation later their net worths had increased to an average of \$4,188. This is not only \$500 more than the highest net worth group accumulated, but also represents an increase of 140 percent in net worth over the period.

Forty-one farmers averaged only \$346 net worth at the time they bought their farms. By 1938 they had accumulated only \$600 less than those who started with nearly \$5,000 more. They increased their holdings over the period by \$2,800, which is more than was accumulated by the group with \$1,350 greater initial assets. The group which was best off as far as initial assets are concerned actually decreased their net holding by \$1,600. This loss took place despite a few more acres of crops than were handled by either of the other groups.

These findings would seem to indicate that a farmer need not necessarily start with large savings in order to make money. On the other hand, it is possible that income from a 65-acre dairy farm is not large enough to maintain as large a net worth as some of these farmers possessed when they bought their farms. There is certainly

no logical reason why large net worth at the time of purchase of a farm should be a handicap to any farmer. Some farmers in each asset group accumulated considerably more than average while others accumulated much less. The cause-effect relationship here probably is size of farm and net assets.

Soil Productivity not Decisive Factor

The question is often raised in connection with the financial progress of farmers as to whether farms of the area with soils of better productive capacity cost more than other farms, and if so, does it pay to assume these additional costs. Practically every field in the township was classified according to its "present inherent productive capacity" by a soils specialist. Five levels of productivity were established: A, B, and C land, which under usual price conditions could well be kept under the plow; D land, questionable for profitable crop production; and E land, which a "combination of unfavorable circumstances" made unsatisfactory to continue to use for crop production.

This classification of the farms of the study shows that per acre crop production did tend to follow the inherent productivity ratings as made by the soils specialist, in that soils A, B and C produced definitely more than soils D and E. Operators on A and B soils in 1945 averaged only a few hundred dollars greater net worth than those on C soils, while the few farmers in the D and E groups had accumulated conspicuously smaller assets than any of the other soil groups. The difference was approximately \$2,400 in 1938.

This difference in net worth between the soil groups is enough to justify a somewhat larger payment for the higher rating farms, if all the difference is attributed to this one factor. It happens, however, that these lower rating farms also had 20 percent less crop land, and as we have seen the size of the farm is very important in accumulating net worth. Also such a conclusion assumes that the farms of each soil group received comparable handling—an unrealistic assumption. The writers found a few instances where the farmers on the D and E soils were hauling manure from the farms with the higher soil ratings and spreading it on their own farms. Some of the farmers on the less desirable soils made special efforts to improve yields that were not practiced by many of the farmers with the better soils.

1946 Study Shows Rapid Turn-over

It is surprising that only seven years after the first study—years of high prices and good farm incomes—only 71 of the 139 farmers visited in 1939 still lived on the same farms. Of the 68 farmers who had moved during this period, only one-fifth were accounted for by natural causes such as death and retirement. None of these farms was taken over by sons or sons-in-law. Nearly 40 percent of the changes were the result of foreclosures and voluntary sales by operating owners, while another 16 percent were renters who were forced to move because of the sale of the farms they were operating. By and large the noncontinuous operators were older, had less yearly income, and fewer net assets than the continuous owners. The fact that many of these farmers were nearing the 60 year mark and had fewer assets may help account for their failure to stay in the area. It also brings out the fact that a relatively large proportion of the farmers interviewed in 1939 were older men.

The accumulation of net assets of the 71 farmers still remaining on the same farms was nearly twice the amount accumulated during the previous 20 year period covered in the 1939 study. The for-

TABLE V. RELATION OF SIZE OF FARM WHEN BOUGHT TO NET WORTH IN 1945

Crop acres Range	Average	Number of farms	Net worth		
			When farm was bought	1938	1945
0-39	31	25	\$1,598	\$2,425	\$5,407
40-69	51	30	1,880	4,311	8,097
70+	99	16	2,749	6,444	9,570
All Farms	55	71	1,798	4,489	7,449

uitous gains resulting from the rapid increases in prices of farm products during this period thus completely overshadows the influence of the management factor which was more evident during times of more normal price relationships. It should be observed that although the farmers with the largest farms continued to increase their net worths during this period of rapidly rising prices, neither their absolute nor relative increase was as great as that of the smaller farms (Table V).

The total income of these larger farms was also much greater

than for the other two groups of farms. They spent relatively more money, however, so that savings during this period were not as large as for the owners of the medium sized farms. It is possible that the farmers with the larger net worths and larger farms did not have the incentive to save and pay off debts that apparently motivated the farmers with the smaller operating units.

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A CALIFORNIA CASE STUDY IN LOCATION THEORY: THE GLOBE ARTICHOKE ON THE MORO COJO

The theoretical solution of a location problem for agricultural crops usually begins with the assumption of perfect competition between owners of land, of perfect knowledge of the market for all crops which may be grown on the land, and of perfect knowledge of the adaptability of various crops to the land. Given this simplified economic model, it is possible to examine the "technological" coefficients of production,¹ and thus to determine the use to which each piece of land will be put. This can be done without examining the motivations of owners of land or of entrepreneurs who may purchase the use of land. It is only necessary that there be a variation in the degree to which the profit-maximizing motive influences the actions of each individual.² But when the conditions of perfect competition are not satisfied, especially when there are only a few owners of land, it is no longer safe to neglect the motivation of the individual, and it is certainly not proper to assume that the landowner in his economic activities is dominated by profit-maximizing motives alone.³

Establishment of the present principal American center of globe-

¹ Production thought of as consisting of all those operations necessary to bring the crop to the ultimate consumer.

² The unnecessarily restrictive assumption is sometimes made that the dominant drive of entrepreneurs must be for maximum profits, e.g., J. M. Brewster and H. L. Parsons, "Can Prices Allocate Resources in American Agriculture?" This *Journal*, November 1946, pp. 938-60. But it is not necessary that the drive to profit maximization be either dominant or general to produce the usual equilibrium solution. If all other conditions of perfect competition are met, including that of unlimited entry, the firms with the lesser degree of profit-maximizing motive will be driven into bankruptcy by their more aggressive competitors. This will continue until only firms with the strongest profit-maximizing motivation survive.

³ Cf. M. W. Reder, "A Reconsideration of the Marginal Productivity Theory," *Journal of Political Economy*, October 1947, pp. 450-58, for a precise definition of profit-maximizing behavior, see T. de Scitovszky, "A Note on Profit Maximization and Its Implications," *Review of Economic Studies*, Winter 1943, pp. 57-60.

artichoke production in the lower end of the Salinas Valley in Central California is an excellent illustration of the part played in economic location by the motivations of the landowner. Artichokes require a climate with rare incidence of freezing temperatures, and, more significantly, one also free from excessive heat and excessive dryness. The Monterey Bay coast, which very seldom has frost and which is cool and foggy during most of the summer, appears to be well suited to the production of the artichoke. The artichoke's requirements are well satisfied by the silty clay loam and fine, sandy loam of the lower Salinas Valley flood plain.

It is not surprising, therefore, to find a crop with such special temperature requirements as the artichoke largely concentrated in this area. The process by which the artichoke found its way to its present principal location, however, does not reveal the smooth functioning of an automatic economic process, but rather the jerky change characteristically produced by a few individual decisions. Furthermore, examination of the way in which the solution of this particular location problem was reached suggests that there was nothing economically inevitable about the result, in the sense in which competition of many owners leads to an inevitable result. The overwhelming determinant was the personality of one strategically placed individual.

The greater part of the land in the Salinas Valley now devoted to artichoke production is contained in the 7,000 acres of the Rancho Bolsa del Potrero y Moro Cojo which the Mexican government granted to Captain J. B. R. Cooper of Boston in 1828. This rancho occupies the valley floor from the Pacific Ocean to a point about five miles inland. It includes almost all the valley land lying in the belt of heavy fog.

The rancho is still largely owned by descendants of the original grantee, and throughout its history much of its area has been under the control of one individual. Decisions as to land use have therefore been unique and personal, and there has been little opportunity for the play of competitive forces within its boundaries. Furthermore, the combination of soil and climate found on the rancho is almost unique, so that there is little basis for comparison with other property.

During the early years of its operation the lands of the Moro Cojo were devoted almost entirely to cattle raising. Probably in the 1860's Captain Cooper began to grow barley and wheat, and

this continued to be the major crop until 1888. In that year, Mr. Claus Spreckels constructed a beet-sugar factory at Watsonville which was the largest as well as one of the first in the United States. At the same time Mr. Spreckels signed the first lease in the Salinas Valley for sugar-beet land: 1,000 acres of the Moro Cojo at the mouth of the Salinas River. When the time came for renewal of this lease, the trustee of the estate, Cooper's son, insisted that Spreckels take the entire ranch. In this way the sugar company came to operate the property, with a short lapse of the lease on one section of it, until 1922.

The Spreckels Sugar Company subdivided the land into tenant holdings and constructed houses and farm buildings on each one of these subunits: these were then sublet to operating tenants who planted a substantial part of the land to sugar beets each year.

For over thirty years, from 1888 to 1922, the Cooper-Molera family which owned the ranch found the arrangement with the Spreckels company quite satisfactory. Rent was paid in advance, and the owners had no responsibility in the administration of their property other than cashing the rent check and paying the taxes. Negotiating a new lease every five years was something of an annoyance, but otherwise the arrangement seemed as good as could be asked for and the owners were content to let well enough alone. If additional income might have been obtained by more active supervision of the ranch, it was not thought to be worth the time and effort necessary to produce it.

In 1919 the death of Mrs. Molera, who had managed the property since the death of her brother, transferred control of over 3,000 acres of the property to her son, Mr. A. J. Molera. The personality of this new administrator had a profound and lasting influence on the utilization of the land placed under his control.⁴ Mr. Molera was not a farmer, and the practice of his family since the death of his grandfather had been to do little more than cash the rent checks. But somehow his interest in farming had been stimulated, and he began to take an active part in the affairs of the Moro Cojo

The Change to Artichokes

Through a friend who was raising artichokes in the Half Moon Bay area⁵ of San Mateo County he became interested in that crop.

⁴ The story of the conversion of the Moro Cojo from sugar beets to artichokes is based in large part on information supplied by Miss Frances J. Molera.

⁵ Some 50 miles north of the Moro Cojo.

The Moleras had already grown artichokes as a garden vegetable on the ranch they owned near Point Sur, south of Monterey, and Mr. Molera was convinced they could be raised on the Moro Cojo. The artichokes in San Mateo County were inadequately irrigated, but Mr. Molera reasoned that if he were to irrigate the excellent soil of his ranch, he should be able to grow large crops of the vegetable profitably.

Artichokes had been grown commercially in coastal districts of San Mateo County as early as 1900, but the acreage remained small and the market limited. Some artichokes were shipped to the eastern cities, but until World War I the principal supplier was France. When shipments from Europe stopped during the war demand for the western crop increased, and by 1921 plantings had been made as far south as Santa Cruz, and amounted to about 3,000 acres.⁶

In November 1921 the *Pacific Rural Press* reported⁷ that the New York produce firm of Steinhardt and Kelly had made arrangements with the San Francisco Artichoke Growers' Association to handle the crop from 5,000 additional acres, of which about 2,000 were to be along the Pajaro River near Watsonville.⁸ Steinhardt and Kelly were to distribute the entire production of the Association on the eastern seaboard. Shortly thereafter the produce firm launched a vigorous campaign to increase the demand for artichokes.⁹

A fifteen thousand dollar banquet was recently given by Steinhardt and Kelly of New York to competitors and customers who were fed artichokes and artichoke talk. This is something new in the way of selling a vegetable. The hosts at this banquet sent out the word that they can handle all the artichokes that they can get. The market is opening up in a conspicuous way and their representatives are now hunting new fields to produce this vegetable which has failed in all parts of America as a commercial crop except in the fog belt along the coast of San Mateo and Santa Cruz Counties.

Apparently the campaign of the artichoke dealers was successful and in July the *Pacific Rural Press* reported¹⁰ "Artichokes were handled through chain stores and in common groceries this season

⁶ E. A. Stokdyk, *Marketing Globe Artichokes*, Univ California Agr. Exp. Sta. Bul. 524, April 1932, p. 5.

⁷ Nov. 5, 1921, p. 462

⁸ The Pajaro River empties into Monterey Bay at a point about seven miles north of the mouth of the Salinas River

⁹ *Pacific Rural Press*, Jan 14, 1922, p. 55

¹⁰ July 1, 1922, p. 10

where heretofore they were handled only by the most exclusive trade."

Over 100 carloads were shipped into the New York market during the season at prices averaging \$8-\$10 per box up to April 1, and \$6 for the rest of the season.¹¹ Regular market quotations were not recorded until 1925, but from then until the end of the decade New York artichoke prices did not at any time rise to \$8 in the New York market, and typically fluctuated around \$4.¹² Prices were high in 1921.

The very attractive artichoke market, plus information obtained from the tenants, convinced Mr. Molera that the revenue from his property could be greatly increased by leasing directly to the farmers, rather than through the sugar company.

When the Spreckels lease expired in November 1921, there was a delay in renewal. Mr. Walter Tavernetti¹³ says that the Spreckels company offered to renew if the rent were cut from \$15 an acre, which they had been paying, to \$12.50 an acre. According to Miss Molera, her brother had found out that the tenants would be willing to pay \$35 an acre and more if he would drill wells on the property. The upshot of the matter was that the lease to Spreckels was not renewed, and Mr. Molera assumed direct supervision of the property and began leasing farms of from 75 to 150 acres directly to farmers, urging them to put in artichokes.

At first tenants were reluctant to invest the capital required for growing this perennial vegetable, which will bear heavily for three or four years, sometimes for as long as ten years, before replanting is necessary;¹⁴ it was not until Molera agreed to furnish the plants if the farmers would put them in that he began to make headway. The first planting was made in the spring of 1922, and by the fall of that year about 600 acres had been planted.¹⁵ By 1925 there were over 4,000 acres of artichokes in the county, mostly on the Moro Cojo.

Change under Large Landowner Differs

The foregoing account illustrates some of the characteristics of economic change to be expected if the decision as to land use is

¹¹ *Idem*.

¹² Stokdyk, *op. cit.*, pp. 23-25.

¹³ Tax Assessor of Monterey County.

¹⁴ A. A. Tavernetti, *Production of the Globe Artichoke in California*, California Agr. Ext. Serv. Circ. 76, rev. October 1947, pp. 7-8.

¹⁵ D. H. Kieffer, "Salinas Delta Becoming Famous," *Pacific Rural Press*, Sept. 15, 1923, p. 263.

made by one large landowner rather than by a number of small owners. Change under these conditions differs from change under competitive conditions in two principal ways: the general economic development is discontinuous and irregular; and the nature of the change is not determined by purely economic considerations.

The large landowner is free to some extent from economic pressure to adjust land utilization continually to changing conditions of the market if the income from the property is so large that any increase in income would appear not to justify the increased time and effort required to bring it about. For this reason there will be a strong tendency for property to be kept in its accustomed use over long periods of time. Thus the Molera family more or less left the Moro Cojo alone for over thirty years; this management policy was changed, not by economic forces, but by the accidents of birth and bequest.

On the other hand, when such an owner decides to change the way in which land is being used there may result a much more rapid conversion than would occur under competitive conditions. One decision only is necessary to bring about conversion of the total area included under one landownership; in addition the large landowner often has easier access to money-capital resources than the small owner simply because of the size of his land holdings. Molera's total investment in improvements on his land must have been considerable. Wells had to be drilled, the land leveled, and ditches dug. In addition, if he was to have better and more permanent farmers, it was necessary to build additional houses, barns, and sheds. Mr. Molera also undertook instruction of his tenants in cultivation of the new crop,¹⁶ and introduced those who needed financing at the local banks. The tenant's investment was not small, but the major burden of conversion had to be assumed by the owner.

Absence of noneconomic pressures may permit changes in land utilization to be largely a function of the personality of the landowner and consequently indeterminant in any social sense, furthermore, there is no guarantee that once change is decided upon the new use to which the land is put will be the optimum use.¹⁷ We cannot be sure, for example, that concentration on artichokes was the

¹⁶ There was very little information in this country on growing of the artichoke. Mr. Molera used as his principal guide a French publication which he had seen advertised in a Spanish farm journal to which he had subscribed. Later the great horticulturist Luther Burbank advised him in the culture of the crop and in the selection of varieties.

¹⁷ If the landlord's decision to change does not arise from a desire to maximize returns the new use of the land may even produce a smaller revenue than the old use

best choice even when the change was first made; we certainly have no firm assurance that it is now the best choice.

Even under "competitive" conditions the problem of testing efficiency of land use is by no means an easy one, but the presumption would seem to be that there is a general tendency for owners who employ land in less efficient uses to be forced to surrender their land to more efficient owners. When the landownership unit is very large, lack of homogeneity of land over very large areas makes it extremely difficult for potential purchasers of the land to make accurate comparisons of the income from the land in its present employment and its possible income under alternative employment.

As far as the economist is concerned the solution under such circumstances must be indeterminate within wide ranges. The lower limit of efficiency is that which will result in the rapid using-up of the capital value of the land; the upper limit of course is the optimum land use available. Within these very wide limits the solution of the land-use problem, when large ownership units are present, is determined by chance as it operates to put control of the property into the hands of a more or less efficient and profit-minded owner

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THE EFFECT OF A REDUCTION IN FARM PRICES ON FARM EARNINGS

OF MAJOR concern to farmers at all times is the trend and the level of agricultural prices. The level of farm prices is one of the most important factors affecting the year to year variations in income received by the farmer. The trend of farm prices (whether up or down) affects the prospects of future earnings. Farm incomes are highly unstable and fluctuate widely from year to year.

Most farm products are sold in a highly competitive market with demand and supply relationships determining the prices received.

The volume of production of individual farm products (especially crops) is subject to considerable variation from year to year, contributing further to fluctuations in the prices of farm products.

On the other hand, prices of things bought by farmers tend to be more rigid. An important factor contributing to the rigidity of these prices is the relative inflexibility of wage rates in industry. In gen-

eral, wage rates rise and fall less than prices and are not adjusted as quickly to changes in demand and supply. This rigidity in wage rates is more pronounced during a period of declining prices. When demand declines for industrial products, workers are laid off and output is reduced. This adjustment of production of most manufactured products to fit the demand helps maintain prices of manufactured products at a fairly stable level. Cash farm production costs then (being largely payments for manufactured products and hired labor) tend also to be rigid. Consequently, when the selling prices of agricultural products decline, net farm income declines even more.

This pressure on net farm income during a price decline is likely to be more intense in the future because of two important changes with respect to farm production costs which have taken place in the last two decades. First, the level of farm costs has risen markedly in the last few years. Farm production costs today are the highest in history. Many farmers now have cash farm expenses higher than their total gross income in previous years. Farm costs for 1948 totaled approximately 18 million dollars which was greater than gross farm income for any year prior to 1942.¹ Second, direct cash expenses now make up a much higher proportion of total farm costs than they formerly did.

Following World War I, many farm costs were not direct cash outlays. Horses furnished most of the power and could be raised on the farm. When prices declined, it was necessary for farmers to accept less than going rates for their labor, thus absorbing part of the price decline in a lower standard of living.

Since then, great strides in farm mechanization have taken place, resulting in a much higher proportion of direct cash outlays. Cash outlays for gas, oil, and repairs are necessary for modern power equipment farming. Mechanization has required a higher investment in farm machinery, the cost of which must be paid out of farm earnings. The improved farm practices widely adopted in the last few years, although highly desirable, have increased total farm costs. Items such as improved varieties of seed, chemical weed control, and the wider use of commercial fertilizers, all are direct cash production costs. The effect of these two changes in the farm cost picture, a higher level of total farm costs and a greater proportion of direct cash expenses, are problems about which farmers are seriously concerned when farm prices decline.

¹ *Agricultural Situation*, BAE, Vol 82, No 11, Nov. 1948.

In order to illustrate more specifically the effect of a decline in farm prices on farm earnings, a comparison has been made between the actual 1948 earnings and the probable earnings, assuming farm prices at 90% of parity (Table I). These figures represent the average receipts, expenses, and net farm income for a group of ten farms in southeastern Minnesota and also similar data for a group of five farms in southwestern Minnesota. These farms were selected from the records of cooperators in the southern Minnesota Farm Management Services. The farms selected in both these areas are larger and more productive than the average for the area. They are more highly mechanized. Major sources of income for the group of farmers in southeastern Minnesota was from the sales of dairy products, hogs, and poultry. For southwestern Minnesota sales of beef cattle and hogs provide the major sources of income. It is emphasized that this illustration is not a forecast that prices will fall to support levels nor is it to be considered as an endorsement of a specific price policy for agriculture. The purpose of Table I is merely to show the general effect on farm earnings of a reduction in farm prices and to supply a guide to farmers analyzing their own records. Farmers, then, must make their own interpretations as to the rate and extent of any future price changes in analyzing the effect on their own earnings.

The average net income received by these ten dairy, hog, and poultry farmers in southeastern Minnesota in 1948 was \$10,404 (Table I). Assuming that prices were at 90 percent of parity with the same output as in 1948, their net income would then average \$7,921. This represents a decline of 24 percent in net farm income, showing the effect in the immediate future of a reduction in farm prices. Receipts for this group of farmers would decline about 17 percent, while costs would decline only 6 percent.

The decline in farm earnings was considerably greater for farms with feeder cattle and hogs in Southwestern Minnesota. For this group, the average net farm income in 1948 was \$6,384. Assuming prices at 90 percent of parity again, their net income then would average only \$2,352, a decline of 63 percent. The wide difference in the effect on earnings of these two different types of farms of a decline in prices to 90 percent of parity is accounted for largely because of differences in the ratios of present prices of various farm products to their corresponding 90 percent of parity figure. Average

TABLE I. COMPARISON OF ACTUAL 1948 FARM INCOME WITH PROBABLE INCOME, ASSUMING PRICES AT 90 PERCENT OF PARITY¹

Item	10 Farms Southeastern Minnesota		5 Farms Southwestern Minnesota	
	Actual value 1948	Value under 90% of parity ²	Actual value 1948	Value under 90% of parity ²
<i>Farm receipts</i>				
Dairy cattle	2,274	1,478	215	140
Dairy products	5,403	4,710	436	243
Feeders	—	—	11,042	6,166
Hogs	4,075	3,206	5,167	3,854
Sheep, lambs and wool	326	228	968	677
Chickens	236	227	286	297
Eggs	1,137	1,331	795	946
Crops	2,314	1,772	4,519	3,753
Equipment sold	340	340	355	355
Misc. income	843	843	762	762
Total receipts	16,048	14,135	24,545	17,193
<i>Farm expenses</i>				
Feeders	—	—	6,131	3,424 ³
Hogs	87	84 ³	898	637 ³
Other livestock purchased	862	570 ³	749	487 ³
Misc livestock expense	213	213	156	156
Misc crop expense	963	915 ⁴	1,010	959 ⁴
Feed bought	1,534	1,233 ⁵	2,395	1,906 ⁵
Custom work hired	583	583	431	431
Power, machine equip new	2,582	2,582	3,088	3,088
Power, machine equip upkeep	1,329	1,329	2,279	2,279
New buildings	910	910	1,623	1,623
Bldgs upkeep	264	264	441	441
Hired labor	1,002	1,002	1,333	1,333
Taxes, and general farm exp	628	628	522	522
Rent	213	213	426	426
Interest	154	154	512	512
Total farm expenses	11,374	10,680	21,994	18,224
<i>Farm income</i>				
Farm receipts	16,048	14,135	24,545	17,193
Increase in farm capital	4,880	4,466	3,833	3,383
Total	21,778	18,601	28,378	20,576
Farm expenses	11,374	10,680	21,994	18,224
Net farm income	10,404	7,921	6,384	2,352

¹ Parity prices as given in *Agricultural Prices* (Monthly), BAE, 1948.² Assuming the same output as in 1948.³ Cost of livestock purchased adjusted downward in same ratio as estimated decline in selling prices of livestock.⁴ Miscellaneous crop expense reduced five percent.⁵ Cost of feed grains purchased adjusted downward to correspond with selling prices. Commercial feeds purchased reduced 10 percent.

prices received for beef cattle and flax in 1948 were much higher relative to parity than were the prices received for dairy products. An adjustment in prices to 90 percent of parity then would cause a much higher percentage reduction in income for farmers whose major source of income is feeder cattle than for those farmers selling dairy products.

Since these calculations were made to show the immediate effect, only those costs which would be reduced in a short time were adjusted downward. These include cost of purchased livestock, miscellaneous crop expenses (cost of seeds and fertilizer) and feed bought. If the trend in farm prices should continue downward for an extended period of time, some of the other costs (which are not adjusted in Table I) would also decline. Also, certain farm costs, such as the purchase of new equipment or the erection of new farm buildings, could be postponed. Certain production costs, however, are likely to remain high for a considerable period of time. Property taxes may even continue to rise when farm prices are falling. Interest and payments on indebtedness are fixed cash payments that do not fluctuate with the price level. Costs of labor and custom work hired are expected to remain high for some time.

This lag in cost rates when prices received by farmers are on the down turn places farmers in a price-cost squeeze, depressing farm incomes even more on a percentage basis than the decline in farm prices. Farmers thus need to concentrate to a greater extent on cost control to produce products as efficiently as possible. The emphasis must be placed upon increasing the output per worker and reducing costs per unit of product.

While farmers today are generally in a stronger financial position than at any time previously, some farmers who have gone heavily into debt in the purchase of land and equipment or in the erection of new farm buildings, will be in a vulnerable position if farm prices decline rapidly. Paying off indebtedness now and the building up of reserves from current income will strengthen the farmer's position in meeting the pressure on net farm income during periods of adverse economic conditions.

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SYNTHESIS OF LABOR INPUTS FOR HOGS FROM TIME-STUDY DATA*

FOR all kinds of farm planning it is necessary to develop sets of input and output data relating to costs, yields, prices, labor requirements and the like. While these are physical items, agricultural economists have considered it necessary to devote a considerable amount of effort to the collection of such data. Economists find it advisable to do this work themselves instead of getting the information from physical scientists because they want to find out "—what technical rates are possible in practice and which the farmer expects"¹ rather than the results of controlled laboratory experiments.

Various sources are used in the development of these "technical rates." For individual farm planning, a farm account book summary may be the principal source. In farm budgeting for research or extension purposes, account books, survey data, and experimental results are used. The search for input and output data represents a considerable share of total expenditures for farm management research. The possibility that too much effort is used up in this way has been raised by Dr. Schultz in the article previously cited, and by others. There is also need for improvement in the quality of input-output data.

The purpose of this paper is to describe a method of synthesizing one type of budget input data—labor requirements—from information secured in a time-and-motion study. The method is applied to the development, for the hog enterprise, of labor inputs that are suitable for arriving at comparative production costs on farms of different sizes. For this purpose, input data must be obtained with a considerable amount of care.

These labor inputs might be taken from survey data, but examination of published labor input figures based upon farm surveys indicates that, although they may be suitable as an expression of average labor requirements in a given area, they would be of limited usefulness in a study of relationships between size of enterprise and costs. The amount of labor reported for small enterprises may be high because of an abundant supply of labor, if labor is substituted

* Prof. L. S. Hardin, Purdue University, made available unpublished materials for use in this analysis.

¹ Schultz, T. W. "Theory of the Firm and Farm Management Research." *This Journal*, p. 584, August, 1939.

for some of the equipment. Thus hand-feeding may take the place of self-feeders, and water may be carried in pails rather than supplied by an automatic fountain. Methods of production may not be the same; some farmers farrow two litters a year, others only one. Results obtained from enterprises of different sizes are likely to vary because of differences in skill of the farm operators. Because of all these variations between individual farms it is difficult to determine whether reported differences in labor requirements are due to size of enterprise or to technique.²

A survey designed to compare efficiency in use of labor on enterprises of different sizes would have to include a very large number of records in order to permit the sorting and subsorting needed to give reasonable homogeneity in the characteristics of farms in different size-classes. Otherwise, the fundamental assumption that observed variations are a result of differences in scale, and not in system, of production is violated.

Because of these limitations on usefulness of survey data, an attempt has been made to calculate labor requirements for hog enterprises of different sizes by synthesizing information from a detailed time and motion study of individual jobs. In this process, the assumed system of production is kept the same, and variations due to differences in skill and dexterity of individual operators are eliminated.

Basic data are taken from an Indiana study of the hog enterprise.³ This study contains detailed time and motion analyses of the principal jobs in hog production as observed on five Indiana farms. While production practices, methods and equipment were not identical on all farms, data were presented in a way to show in detail the processes used performing each job and time spent on each operation, as recorded in stop-watch studies.

The procedure involved in synthesizing labor inputs from these data was as follows: First, certain assumptions were made as to the system of hog production, production practices, and equipment. The average distance traveled from the farmstead to the hog pasture was assumed to be 40 rods. It was assumed that an average of

² For examples of survey data on labor requirements by size of hog enterprise see: J. A. Hopkins, "An Economic Study of the Hog Enterprise." *Iowa Agr. Exp. Sta. Bul.* 294, 1932; and H. C. M. Case and R. C. Ross, "The Place of Hog Production in Corn Belt Farming." *Ill. Agr. Expt. Sta. Bul.* 301, 1927.

³ Oberholtzer, John W., *The Application of Motion and Time Study Techniques to Certain Agricultural Enterprises*. Purdue University, June, 1944. Unpublished Thesis.

6.1 pigs were saved, and 5.7 raised per litter, and that pigs were sold at 235 pounds and sows at 335 pounds. It was assumed one boar would be kept for each 30 sows and that a boar would be maintained if there were as many as five sows. Based upon a number of publications on hog production, a list of jobs connected with the enterprise was developed, and for each job a process was outlined. These jobs and processes are shown in Table I. For most of these processes, it was possible to adapt data from process charts in the Indiana study for the approximate total time required for each step of the process. One of these process charts is shown as Table I. This illustrates the kind of detailed measurements on which estimates in Table I were based. From the nature of each process, a decision was made as to the degree to which labor time would vary with changes in number of hogs. Time spent in travel, in starting tractors, or opening gates, was generally considered as fixed. A few operations were considered to be semi-fixed, such as hauling loads of water or feed, where time would not vary by individual sows, but by groups. Operations that primarily involved work with the hogs were considered to require a constant amount of time per hog.

With information given in Table I it is possible to construct a series of estimates, by jobs, of time requirements for different numbers of hogs, assuming no change in production practices, as shown in Table III. A question may be raised as to practicability of assuming the same practices for large and small numbers of sows. Consideration of the jobs to be done and the processes followed indicates that the system assumed fits both cases fairly well. Perhaps more allowance should be made for greater distances traveled with larger numbers, and in a few instances a producer of a small number of hogs might find it advisable to do more hand carrying of feed and water, but these are minor deviations.

Total hours per sow computed in this manner is somewhat lower than is usually reported in farm surveys. According to Dr. Oberholtzer, much of the difference between time required for an operation according to a stop-watch study and a survey can be explained as follows. "In the stop-watch studies only the time spent in actual labor or in necessary delays was recorded. The surveys tend to include time spent with the hogs when the operator was not working and when his presence was not necessary."⁴

While computed time spent on hogs is usually lower, variations

⁴ J W Oberholtzer, *op. cit.* p. 145

TABLE I JOB ANALYSIS OF THE HOG ENTERPRISE, WITH APPROXIMATE TIME REQUIRED PER 20 SOWS^a

Job	Process	Minutes per 20 sows		
		Total	Fixed	Vari- able
Spring Farrowing (21 days)				
Move houses 40 rods to pasture	Move with tractor, 2 houses per trip			
Clean and bed	Spray interiors of houses. Haul straw from stack and bed houses.	1,048	98	950
Move sows into houses	Haul in low wagon, tractor drawn.	440	44	396
Care during farrowing	Four daily trips to farrowing pens on foot.	736	420	316
Hauling feed	One load (about 30 bu) hauled per ten sows during farrowing period	74	18 ^b	56
Hauling water with 800 gal. tank wagon. (Assuming 3 gal per sow, four trips will take care of 20 sows for entire period)	Fill water wagon while doing other chores. Start tractor, drive 200 ft to wagon, hitch and drive 40 rods to field, open gate, drive through and close. Drive 100 ft to farrowing quarters and insert hose. Fill fountain while watering at quarters, remove hose, return to well, unhitch and return to tractor	60	—	60
Feeding and watering; twice daily	Walk to farrowing quarters, feed and water sows (feed and water available at quarters), return from farrowing quarters	534	210	324
Spring Suckling (42 days)				
Clean and bed houses	Clean houses and haul straw as above	740	60	680
Castrate	Pen sows in farrowing pens and pigs in farrowing houses. Catch pigs, lay on wall of house and castrate. Put pigs in pens with sows.	225	5	220
Vaccinate	Handle pigs in same manner as above.	225	5	220
Wean	Build creep around self-feeder (3 feeders for 20 sows)	44	17	27
Feed and water	Feed ear corn to sows twice daily, pigs fed in self-feeders in creep.	3,515	2,189 ^b	1,326
Summer Feeding (140 days)				
Sort for market	Set up pens, drive into pens	636	127	509
Haul feed 40 rods and fill feeders	One load corn (2,000#) every every other day for 120 pigs.	2,590	—	2,590
Water	Haul with tank wagon to 100 gallon fountain waterers in field. One trip every other day for 120 pigs.	2,128	700 ^b	1,428
Summer Feeding, sows (60 days)				

^a Data derived from process charts in unpublished thesis "Application of Motion and Time Study Techniques to Certain Agricultural Enterprises" by J. W. Oberholtzer, and other sources.

^b Semi-fixed.

TABLE I (Continued)

Job	Process	Minutes per 20 sows		
		Total	Fixed	Variable
Haul feed and fill feeders 8 3# corn per sow per day	Same as for other hogs.	176	36	140
Haul water and fill waterers	Same as for other hogs.	504	300	204
Summer Gilt Mgt (140 days)	Time assumed to be same as summer feeding hogs, and included with it.			
Winter Sow Mgt (162 days)				
Move houses and clean	Same as during spring farrowing	713	63	650
Move sows	Same as during spring farrowing.	440	44	396
Breeding		272	27	245
Bedding	Haul straw from stack to quarters and bed houses	212	42	170
Haul manure		300	60	240
Feed and water	Walk to quarters, throw feed into pens, clean and fill water troughs Feed stored near hog quarters and water piped to quarters.	2,462	1,166	1,296
Care of boar, assuming 1 boar per 30 sows		1,200	1,200	—
Total time for 20 sows, minutes		19,274	6,831	12,443

TABLE II. WATERING AND INSPECTING 100 HOGS ON SUMMER PASTURE, HAULING IN TANK WAGON, TRANSFERRING TO FIELD FOUNTAINS, ONE TRIP EVERY TWO DAYS*

Operation	Total time minutes	Fixed time minutes	Variable time minutes
Tank filled while doing other chores	0 0	0 0	0 0
Start tractor and drive to wagon at well (200 ft)	1 3	1 3	
Hitch to water wagon	4	4	
Drive to gate to field (660 ft.)	2 1	2.1	
Open gate, drive through, close	1 2	1 2	
Drive to water fountain (100 ft)	8		8
Put hose from tank to fountain	4		4
Inspect hogs and wait for filling (walk 200 ft.)	15 0		15 0
Take hose from tank	.4		.4
Drive to gate to field (100 ft)	8	8	
Open gate, drive through, close	1 2	1 2	
Drive to well (660 ft)	2 1	2.1	
Unhitch	.4	.4	
Drive tractor to barn	1.0	1 0	
Total	27.1	10 5	16.6

* Adapted from J. W. Oberholtzer, op cit. Process Chart 5, p. 63, but distance, gate to field reduced from 80 rds. to 40 rds. Distribution between fixed and variable time added.

TABLE III. LABOR REQUIREMENTS FOR HOG ENTERPRISES WITH DIFFERENT NUMBERS OF SOWS

Period and operation	Number of sows									
	5	10	15	20	25	30	35	40	45	50
	hours	hours	hours	hours	hours	hours	hours	hours	hours	hours
Spring Farrowing (21 days)										
Move houses, clean and bed	5.6	9.6	13.5	17.5	21.5	25.4	29.3	33.3	37.3	41.6
Move sows into houses	2.4	4.0	5.7	7.3	9.0	10.6	12.3	13.9	15.6	17.2
Care during farrowing	8.3	10.8	11.0	12.3	13.8	14.9	16.2	17.5	18.8	20.2
Hauling feed	.4	.6	.8	1.2	1.6	1.8	2.2	2.5	2.8	3.1
Feeding and watering	4.8	6.2	7.6	8.9	10.2	11.6	13.0	14.3	15.6	17.0
Haul water	.4	.6	.8	1.0	1.2	1.4	1.6	1.8	2.0	2.2
Sub-total	21.9	31.3	39.4	48.2	57.1	65.7	74.6	83.3	92.1	101.3
Spring Suckling (42 days)										
Clean and bed houses	3.8	6.7	9.5	12.3	15.2	18.0	20.8	23.7	26.5	29.3
Castrate and vaccinate	2.0	3.8	5.7	7.5	9.3	11.2	13.0	14.8	16.7	18.5
Build creep for weaning	.4	.5	.6	.8	.9	1.0	1.1	1.2	1.3	1.4
Feed and water	32.9	38.4	53.0	58.6	64.1	87.9	93.4	98.9	104.5	110.0
Sub-total	39.1	49.4	68.8	79.2	89.5	115.1	125.3	138.6	149.0	159.2
Summer Feeding (140 days)										
Sort for market	4.2	6.4	8.5	10.6	12.7	14.8	16.9	19.0	21.2	23.3
Haul feed and fill feeders	10.8	21.6	32.4	43.2	54.0	64.8	75.5	86.3	97.1	107.9
Haul water and fill waterers	17.6	23.6	29.5	35.5	41.3	48.2	54.6	60.9	67.3	74.5
Sub-total	32.6	51.6	70.4	89.3	108.5	127.8	147.0	166.2	185.6	205.7
Summer Feeding sows (60 days)										
Haul feed and fill feeders	.7	1.5	2.2	2.9	3.7	4.4	5.1	5.9	6.5	7.3
Watering	5.9	6.7	7.6	8.4	9.2	10.1	11.0	11.8	12.6	13.5
Sub-total	6.6	8.2	9.8	11.3	12.9	14.5	16.1	17.7	19.1	20.8
Winter Sow Management (162 days)										
Move sows	2.4	4.0	5.7	7.3	9.0	10.6	12.3	13.9	15.6	17.2
Move and clean houses	3.7	6.5	9.2	11.9	14.6	17.3	20.0	22.7	25.4	28.1
Breeding	1.5	2.5	3.5	4.5	5.5	6.6	7.6	8.6	9.6	10.6
Bedding	1.4	2.1	2.8	3.5	4.2	5.0	5.7	6.4	7.1	7.8
Haul manure	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0
Feed and water	24.8	30.2	35.6	41.0	46.4	51.8	57.2	62.6	68.0	73.4
Sub-total	35.8	48.3	60.8	73.2	85.7	98.3	110.8	123.2	135.7	148.1
Care of Boar	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
Total hours	156.0	208.8	299.2	391.2	479.7	544.4	596.8	659.0	711.5	766.1
Hours per Breeding Unit	31.2	20.9	17.9	16.1	15.0	14.8	14.5	14.0	13.6	13.3

in labor input with changes in size of enterprise correspond fairly closely to survey results for small and medium sized herds. The synthesized data show a smaller decline in labor requirements than survey data, when medium and large herds are compared.

Experience gained in working through this synthesis of time-study data permits the following conclusions to be advanced with respect to usefulness of the approach as a source of budgeting information: (1) Synthesizing of input data requires intimate knowledge of the processes and operations involved in an enterprise. Some of this may be gained in making the time-study, but if the purpose is to set up typical budgets for an area, a survey is needed to show the typical situation with respect to equipment and practices. (2) Analyzing an enterprise in terms of jobs and processes facilitates the explanation of labor savings associated with volume of business. (3) Stop-watch studies tend to show minimum requirements. The person studied, knowing he is being watched, probably devotes his attention more strictly to the job at hand than he usually would. He may also move at a smarter pace than is customary. Time and motion studies omit or minimize time spent by farmers in looking over their crops and livestock, speculating on alternative lines of action, and making decisions. However, it should be relatively easy to develop a correction factor by comparing survey and time-study results on identical farms. (4) Time study data permit development of input requirements for a specific set of conditions, while survey data usually conceal wide differences in size of enterprise, equipment and practices used, and soil and weather conditions. (5) Where time-study data are available, labor inputs can be synthesized at low cost.

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HIGH FARM INCOME AND EFFICIENT RESOURCE USE

WILL prosperous conditions in agriculture, if achieved by government programs, keep excessive numbers of people and other resources in agriculture? Orthodox economic analysis leads most farm economists and farm leaders to say yes. They conclude that if a farm program were successful in keeping farm income at a higher level than free market prices, one of the important un-

desirable results would be too many people and too many other resources in farming—inefficient resource use. They hold this up as one of the great social and economic dangers of government programs for agriculture.

But a broader and more thorough analysis of forces at work in determining resource use in agriculture throws grave doubts on the accuracy of the orthodox answer. More people are born on farms every year than can find permanent jobs in agriculture. There is also a large fund of improved technology not yet adopted by farmers. These are two of the basic considerations in efficient resource use in agriculture.

Assuming jobs are available outside agriculture, will excess farm people move out faster under relatively high or relatively low prices for farm products? The first answer is that low prices will drive them out faster, but when one looks at historical trends one finds it is the areas where family incomes have been highest that farm consolidation, farm mechanization and city migration has been the most rapid. Between 1930 and 1940 farm population declined one percent in Iowa and increased 3.5 percent in South Carolina and 7.3 percent in Tennessee. Children in higher income families receive more school and college training and have more assistance in migrating to new jobs than children in low income families. In the past at least, and this has been true in the post-war years, farming at its most prosperous levels has been less desirable than many other occupations. There has been a reduction in the working force and a rapid increase in size of farms in the immediate post-war years. Farm prices have been above parity but the evidence does not support the orthodox answer that high incomes hold more people in agriculture.

Again in the field of technology the most significant observation is that high prices speed up the adoption of improved technology and low prices slow down the rate of adoption. It is true that more machinery, more fertilizer, more insecticides and other materials will be used in agriculture at a high level of farm income than at a low level of income, but farm consolidation will be speeded up and most family farms are now too small to use new machinery most effectively. Farm families will be released from agriculture by the adoption of improved technology, and members of farm families will be released from farm work at earlier ages to attend colleges

and vocational schools or to find non-farm jobs as more machinery and equipment is purchased with the higher incomes.

Proposals to maintain farm income at higher than free market price levels should be questioned from the standpoint of the controls and regulations which may be associated with them. They may lead to a transfer of income from non-farm to farm people that cannot be justified by socially acceptable criteria. There may be other reasons for disapproving of such proposals such as the growth of "big government"; but there is little basis for the fear that they will keep excess people in agriculture.

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BOOK REVIEWS

Rural Life in the United States. Carl C. Taylor, Arthur F. Raper, Douglas Ensminger, Margaret Jarman Hagood, T. Wilson Longmore, Walter C. McKain, Jr., Louis J. Ducoff, Edgar A. Schuler. New York: Alfred A. Knopf, Inc., 1949. Pp. xviii, 549. \$5.00.

This book is a contribution from the past and present staff of the Division of Farm Population and Rural Life of the Bureau of Agricultural Economics of the U. S. Department of Agriculture. It is a mine of information made possible by the collaboration of specialists. It is organized into five parts:

- I. Rural Society and Rural Sociology
- II. Rural Organization
- III. Rural People
- IV. Rural Regions
- V. Farmers in a Changing World

Rural sociology has, in fact, been farm sociology and this book follows the traditional pattern. The entire community is covered in discussing occupations and in considering conditions common for all in the community such as schools and facilities for medical care. The book is addressed primarily to rural sociologists, yet agricultural economists will get much from it. Many sections, especially those relating to population and labor force, provide important reference material for agricultural economists. For the most part the discussion avoids promotion. A notable exception is chapter 6, "The Rural School and Education," where the opening sentence, "the plight of the rural school," serves as the theme.

There are some omissions, cursory treatments and orientation of materials that detract somewhat from the over-all usefulness of the book. Some of these may have arisen because of agency bias or attitudes that come from professional specialization, but others do not so readily suggest such explanation. Such matters as the alleged domination (at least in some states) of the Agricultural Extension Service, by one or another of the powerful farm organizations; and duplication in counties among numerous agencies of the U. S. Department of Agriculture, for example, are omitted. Furthermore, the data as to equality of income selected for presentation are those that lend maximum support to the theme that farmers are a disadvantaged group. On p. 298 is a chart that shows per capita

income of nonfarm people close to three times that of farm. Yet a national survey for the year 1941 (see U. S. Dept. Agr. Misc. Pub. 520 and U. S. Dept. of Labor, Bul. 822) reports the following per capita incomes for families of two or more:

<i>Group</i>	<i>Per capita income</i>	<i>Farm income equals 100</i>
Farm operator	\$409	100
Rural nonfarm including farm laborer	447	109
Urban	828	202

For these data nonmoney income in the form of food from the farm and garden is valued on the basis of prices that probably would have been paid had it been purchased. If farm laborers had been included with the farm rather than the rural nonfarm group the difference would have been increased somewhat, but even so quite different contrasts would have resulted from those used in the book. Furthermore, in discussing inequality of income, disparity between farm and nonfarm people is featured much more than that within agriculture. Little is said of the pressure that led to the shrinkage of the program of the Farm Security Administration designed to assist low-income farm families.

Juvenile delinquency is omitted in spite of the fact that a national conference was held in 1948 for which a separate report was prepared for farm communities. The discussion of "prospective development" of social security seemed less forthright than would be desirable if an understanding is to be developed of the forces operating on various legislation programs. In the final paragraph is a sentence referring to the "social conservatism of politically influential farm groups." The next sentence tells us, however, that rural public welfare is expected to lag behind urban public welfare because of the inadequate tax base.

More and more as attempts are made to use social sciences for predictive purposes it is recognized that the findings of various subject matter fields such as characterize college curricula should be synthesized. The various subject matter fields have too often gone their separate ways. Agricultural economists would be helped if sociologists (to whom has largely been left the investigation of population, at least in the United States) could tell them more about the nature of the decisions that underlie labor mobility. What, for example, is the income differential necessary to induce moves either in place of residence or occupation? What is the relation of the differential to distance? It would be helpful to know who is shifting

from nonfarm to farm place of residence and under what circumstances. Information beyond that on page 240 is needed. It would be important to know if those arriving on farms from nonfarm areas are coming for the most part to the fringe farm population. Perhaps with a different definition of terms they would be looked upon as merely moving from one nonfarm location to another.

Rural sociologists are also limited by the shortcomings of the economic data available and their analysis. Over and over again welfare implications of farm-nonfarm comparisons are invalidated because of lack of measures of differences in the cost of living. Some confusion is also introduced by erroneous interpretation of consumption data. The high cost of medical care at low income levels, for example, is overemphasized. The survey for any year may be heavily weighted with those who are much below their long-run income position because of the illness of the main earner. In other words the cost of sickness is high at the low income level because sickness that brought high doctor bills perhaps also brought the low income.

To make more meaningful the great mass of detail the book presents, more attention should be given to hypotheses and their testing. Focusing on certain current situations would have much merit. For example, it seems highly desirable at the present time for rural sociologists to throw light on the reaction of rural people to administrative arrangements implicit in proposed or actual legislation directly affecting them. Some social scientists fear concentration on practical issues on the grounds that advance comes from pure science. It seems highly probable, however, that advance comes from striving to answer questions urgent enough to give impetus to creative efforts. Such selection does not preclude rigorous analysis.

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Major Economic Forces Affecting Agriculture with Particular Reference to California, S. V. Ciriacy-Wantrup, Hilgardia, Berkeley; University of California, 1947. Pp. 76. Contribution from the Giannini Foundation of Agricultural Economics.

Californians who hold that the economy of that state is essentially a thing apart from the economy of the remainder of the country, will find Professor Wantrup's volume most enlightening. Agricultural economists who have been reading or writing on the subject

of trends and fluctuations in farm production, prices, income and costs and the relation of various categories of national income to farm prices and income will find much of the first half of this volume a familiar story. Students of international trade and finance will probably not be too pleased with the brief treatment of and minimized role ascribed to foreign trade and its relations to United States agriculture.

Those who look to monetary and fiscal gods alone to lead us from the business cycle wilderness will find little cheer in Wantrup's thesis. On the other hand, those who have discovered order and logic in the Keynesian slant on economic theory and policy will be at home in the solid second portion of *The Major Economic Forces Affecting Agriculture*.

Aside from the greater rate of expansion of California's agriculture, especially during 1910-30, the fluctuations in the substantive economic aspects of agriculture were shown to follow a closely similar pattern for California and for the United States.

Series of data (arithmetic averages) and related descriptive material covering for the most part the period 1910-1947 include farm employment, commodity prices and production, farm income, and major farm production expense categories. The major concern of this study is with the demand side of the farm price and income equation. As an introduction to demand analysis, the familiar relationships between non-farm national income and income of industrial workers to farm prices is stressed. The author properly points out, however, that those relationships are merely the immediate or first line manifestations of more basic economic forces which ultimately determine the level and fluctuations of farm prices.

Foreign trade in farm products is placed far down the scale of importance among the economic forces affecting agriculture. The relative size of domestic and foreign markets for United States farm products is offered in explanation of the minor role ascribed to foreign trade. The treatment of this subject was not as complete or penetrating as one might well expect from the author. On the other hand, the assumption that a high volume of foreign trade would be associated with high-level economic stability in the United States and abroad is well taken and in considerable measure justifies the relative lack of emphasis on foreign trade.

Money likewise is given a minor role among the economic factors important to agriculture. It is asserted that, "money may have ef-

fects upon prices," indirectly through the stimulation or discouragement to investment. A small influence of the changing quantity of money may come through its effects of interest rates which in turn are related to investment as an "internal condition." The purchasing power of monetary metal producers is offered as a relatively minor "external stimulus of investment." More significance is attached by the author to the alleged fact that "... in a correlation with investment and prices, the quantity of money must be generally regarded as a dependent rather than an independent variable" and thus a result rather than a cause of economic activity.

An unbalance between saving and investment is credited with being the critical element behind the disturbing fluctuations in farm income. Idle balances from savings out of income, regardless of their location, are the culprits which change the subsequent magnitude of the income stream and lead to. (a) a new equilibrium at a lower level of prices, if prices are flexible, or (b) if prices are inflexible, a viscous deflationary circle which can be checked only by decreased saving or expanded investment.

The meaning, determining factors and significance of savings and investments are ably reviewed and reasonably well supported with data and charts. Institutional rigidities in farm prices and wages, introduced by support price legislation and labor unions, respectively, are viewed with some alarm as impediments to improvement in investment conditions. The implications of widespread rigidities in prices in the industrial sector of the economy are strangely absent from this section.

A concluding section is devoted to an able review of "Some Implications for Public Economic Policies and for Individual Action." Farmers are urged to shift their attention and efforts for aid from agricultural legislation to policies more directly related to stability of investment and non-agricultural income. Government subsidies for expanding and stabilizing the income stream should not be diverted to savings nor to consumption but rather, to increasing investment which involves a large secondary support to employment, investment and consumption.

As a parting shot farmers are advised as to self-help measures. Leading these is the ever sound advice to "... keep himself well informed. . . ." Proper management of expenses, savings, and investment are stressed in the remaining points.

CHARLES M. ELKINTON

State College of Washington.

Security for the People, Roland W. Bartlett, Champaign: Garrard Press, 1949. Pp. vii, 295.

It is commendable that an agricultural economist in a very specialized field should be concerned about broad public problems. Certainly the problem of maintaining a high level of employment is important to "high farm income." Also, as the author states, it is relevant to present day problems that might lead to World War III.

There is need for a book that would draw together and summarize the best thinking and writing on the problems of employment and economic stability. A book of this kind should be written in non-technical language, for intelligent leaders in public policy who may not be professional economists. One might hope that a book with the subtitle, "Ways of Maintaining Full Employment and High Farm Income," might do this. A reader who is looking for a book of this kind will be disappointed with *Security for the People*. It makes no claim to being such a book. Monetary and fiscal policy is mentioned in three one-sentence statements in various places in the book with the first such statement accompanied by a footnote stating, "An analysis of such policies is, however, outside the scope of this book."

The first two sentences of the preface indicate the major emphasis. "For the first time in American history, we had continued mass unemployment during the decade of the 1930's with nine million unemployed workers as recently as 1939. The major cause was the exaction of monopoly prices by a few large mass-production industries."

The author then proceeds to try to demonstrate that the problem of avoiding depressions (he does not discuss the related problem of inflation) is primarily the problem of controlling monopoly in "a few large mass production industries."

The first chapter and the last chapter are summaries. A program of action is recommended for labor, industry and agriculture. "This should include a program:

"1. Showing that the downfall of private capitalism and continued mass unemployment in European countries was caused by monopoly controls of price and production.

"2. Giving full publicity to wage and price policies of controlled industries in the United States which cause unemployment.

"3. For preventing monopolies and wasteful competition and encouraging constructive competition.

"4. For curbing monopolies by encouraging free enterprise cooperatives, chain stores, and self-sustaining or self-liquidating municipal or regional government-operated businesses to compete vigorously with independent private business.

"5. For studying the possibilities of:

a. Guaranteeing 52 checks a year to wage earners in place of the present system of an uncertain number of checks each year.

b. Gearing total wage pay rolls to some fixed proportion of sales value of product or physical volume of production in place of inflexible hourly wages.

"6. Initiating a long range educational plan for each major industrial state directed toward maintaining full employment.

"7. For developing monetary, fiscal and tax policies which will alleviate depression."

The balance of the book is devoted to discussing this kind of program, with the important omission of a discussion of fiscal and monetary policy.

It is difficult to conceive of a book written on the subject of maintaining full employment which would make no reference to the great quantity of very able and scholarly work by some of the best minds in economics in recent years. This book has a long list of references at the end of each chapter, and yet there is not a single reference to any of the writing since 1935 by competent economists which has been stimulated by J. M. Keynes, *General Theory*. It is as if none of it had been written. Though the book deals specifically with the problem of price flexibility and full employment, no reference is made to recent writing by Simons, Pigou, Lange, Modigliani, and Patinkin.

Certainly price flexibility has a bearing on maintenance of a stable high level of employment. There is, however, considerable reason to doubt how effective a successful policy of price flexibility alone (wage flexibility received little attention) would be in a dynamic society in solving the problem of maintaining a high and stable level of employment.

There seems to be no reason for completely ignoring the monetary and fiscal aspects of the problem. It is doubtful that a book on this subject which completely ignores the basic problems of aggregate demand will receive very serious consideration.

WALLACE E. OGG

Farm Work Simplification, Lawrence M. Vaughan and Lowell S. Hardin, New York: John Wiley and Sons, Inc., 1949. Pp. xii, 145. \$2.80.

This publication is the first book to be devoted entirely to the simplification of farm work, an area of study which has been receiving increased attention from agricultural economists and agricultural engineers since 1942. It is, according to the Foreword and Preface, a compilation of the experiences, methods, and results of the men who have been doing research, teaching and extension work in the agricultural colleges. The book will be welcomed by these men and, in addition, will be very useful to students, farmers, and all others who are interested in "the application of the industrially developed techniques of scientific management and engineering methods to farm work."

The first part of the book discusses the role of work simplification in American agriculture, gives empirical evidence of savings in labor by the application of work simplification techniques, lists the principles of effective work, and suggests ways in which farmers may use the results of work simplification studies. The first chapter defines work simplification as "the development and use of easier, quicker, and more economical ways of doing farm jobs." The savings of time and energy, in addition to removing some of the drudgery from farm work, may result in decreased cost and increased income. The increase in income might come from improvements in methods used on enterprises where the savings were made and from the application of labor saved to other productive work. The second chapter is devoted entirely to the presentation of statistical evidence of the amount of labor that can be saved by applying farm work simplification techniques to various farm enterprises. The third chapter gives the principles of effective work that apply to simplifying handwork, reducing chore travel, and using equipment and work crews effectively. The fourth chapter makes specific suggestions for putting across work simplification ideas to farmers and for the application of these ideas by farmers on their own farms.

The second part of the book "is prepared for those who may be planning to make a research study of work methods or teach the principles and procedures of work simplification and for reference reading by students taking courses in work simplification." Suggestions are given on organizing and conducting work simplification studies, on techniques of analysis and on teaching methods to be

used in short courses for county agents, vocational-agriculture teachers and others, and in regular high school and college courses.

The engineering aspects of farm work simplification receive major emphasis in this book with only casual mention of the economic implications. There is a tendency to advance farm work simplification as the panacea for all the problems of the individual farmer. Additional emphasis should have been given to the point that a farmer's net income will be increased by the use of work simplification only if crop and livestock productivity is increased, if costs are reduced, or if the farm business is large enough to use productively the labor saved. Possible savings in processing plants for agricultural products should have been mentioned because some of these savings would probably be passed back to the farmer in the form of higher prices for his products. Research and extension people in the state colleges do not confine their activities to the individual farm. Research and extension work in work simplification should be concentrated in the areas where the greatest savings can be made.

The second chapter appears to be an attempt to justify or sell farm work simplification and would probably have been more useful if it followed Chapters III and IV to illustrate the application to specific farm enterprises. The effectiveness of the presentation of the principles of effective work in Chapter III is lessened by giving an example first and then listing the principles. The book is well-illustrated and is written so that it can be readily understood by farmers and others interested in practical applications. It should be read by all those who are interested in farm management work.

EVERETT E. PETERSON

Michigan State College

Marketing Poultry Products, E. W. Benjamin, H. C. Pierce, W. D. Termohlen. New York: John Wiley & Sons, Inc., 1949. Fourth edition, Pp. 389, Fig. 163. \$6.00.

The term "marketing" has been used in a very broad and inclusive manner. In the Research and Marketing Act there is no specific definition of the term. However, it is generally accepted that marketing of an agricultural product begins where the crop is harvested or first purchased, and ends when the product is purchased by the consumer. Hence, a book on marketing should include not only a discussion of the physical aspects involved in bringing the

product to the consumer, but should also cover the economics of distribution. Under this latter heading might be included the factors entering into the farm-to-retail price spread, discussion of costs and efficiencies in the market operations, factors affecting supply and demand, and the effects of governmental policies on the marketing system. Also, in recent years, there has been a very healthy development in marketing books in that the descriptive material is largely used to give the student some understanding of the problems as an aid to improving the marketing system.

With these few introductory remarks in mind, *Marketing Poultry Products* is a very difficult book to review as it covers primarily the physical aspects of moving poultry and eggs to market, and in places discusses poultry husbandry. A more appropriate title might be along the following lines—How to run a poultry and egg business. There are six chapters (Chapters III–VIII) discussing feeding station and plant operations, proper plant layout, etc., but barely any reference to costs of operations or efficiencies in size of operation. There is a chapter each on the preservation of eggs and poultry. These give the proper temperatures, humidities, packing materials, etc. relating to the storing of poultry and eggs but do not mention the effects of storage on prices. The authors discuss at some length the grades and grading of poultry products (about twenty-five pages are given over to reproducing USDA grades) but not a word about the effects of grades and standardization on the marketing of the products. Chapter IX, "Transportation" sets forth the proper methods of loading and refrigerating railroad cars, but no idea of the part played by railroad rates in marketing poultry products. The chapters entitled "Retailing Eggs and Poultry" and "Advertising" tell how to retail and advertise the products but do not mention farm-to-retail price spreads, or how to reduce marketing margins.

The chapters on "The Industry" (Chapter I) and "Prices and Market Reporting" (Chapter XVII), are very incomplete. For example, there is no discussion whatsoever as to the changing seasonality of production of eggs, and its effects on prices. There is no reference to the changes in poultry meat output due to the tremendous growth of the broiler industry. There is not even a single mention of the increased size of operations of the individual producer and its effect upon the marketing of poultry and eggs. The only reference to a price analysis on eggs mentions the results of an unpub-

lished study made by the Econometric Institute for a private firm. The latest price study on poultry meat the authors could find is one made by Buechel in 1929.

Factors affecting supply, concerning which there has been much work both inside and outside government circles, is not touched upon. The statement, "the consumer demand for eggs is generally greatest during Lent when egg prices are at their low" (p. 304), indicates a lack of understanding as to the nature of demand. Other statements are open to question, such as "hedging has perhaps brought about a slightly higher market for spot eggs during the storing season."

Except for some new material on freezing and drying eggs and eviscerating poultry, this edition has little that is new or improved from the 1937 edition. In fact, the bibliography in the 1937 edition was very complete, which can't be said for the bibliography in this edition. Most of the figures are old except those on eviscerating and cut-up poultry and the freezing and drying of eggs. A particularly bad example is that of a kosher slaughter house (p. 261), which was taken at least fifteen years ago. Two new tables are presented in this edition.

To this reviewer, as a former USDA employee, it is inconceivable that the authors could write a book on marketing and refer to the work of the Bureau of Agricultural Economics only once, and then merely to mention a hatchery report. But what appears even more strange is the lack of any discussion on governmental policy.

The authors are well known and held in high repute in industry circles. Earl Benjamin, who wrote the first two editions, taught the first course in Poultry Marketing at Cornell, and for many years has been connected with the cooperative movement on the West Coast. "Doc" Pierce, who collaborated on the third edition, also taught for many years at Iowa State College, and is now Director of Poultry Research for the Great Atlantic & Pacific Tea Company. "Dewey" Termohlen, who joined the other two in writing this fourth edition, is probably the most widely known individual in the poultry industry. Among his many positions he is now the Director of Poultry Branch, Production and Marketing Administration, and President of the World's Poultry Science Association.

The 1937 edition was considered a good book in its day. Since that time, the poultry and egg industry, along with the rest of the agricultural economy, has moved forward and changed tremen-

dously. This book does not reflect that. The 1949 edition might be of some help to the novice entering the field of processing and distributing poultry products. To the student of marketing and marketing problems, there is little to be gained by its perusal.

GERSON G. LEVIN

Olson Brothers, Inc., North Hollywood, California

Urban Land Economics. Richard U. Ratcliff. New York: McGraw Hill Book Co., 1949. Pp. xii, 533. \$5.50.

Urban land economics is a young and rapidly developing field. Like the broader field of general land economics, of which it is a part, its development for the most part has come during the last 25 to 30 years. Throughout this period considerable research has been done on urban land problems and numerous concepts have been formulated. Yet this is one of the first books that attempts to organize and systematize the thinking in this field. As such, it comes as a welcome and long needed addition to the literature on land economics.

Professor Ratcliff states as his purpose the presentation of "an orderly body of facts and principles that have more or less direct application to the utilization of urban land." He advances the thesis that "the determination of urban land use is a market process" (p. vi). This thesis is developed in the organization of the book.

The first three chapters may, in a sense, be considered as introductory. Chapter 1, "The Institutional Aspects of Real Property," discusses the concept of property, or as the author writes: "deals with the commodity that is traded in the market—rights in land." The following chapters, "The Economics of Urbanization" and "The City as a Social Complex," present interesting and basic economic and social data concerning urbanization and urban areas.

Chapters 4 and 5 are concerned with the demand for residential and non-residential space. In these chapters consideration is given to the effects on the demand situation of factors such as population changes, migration, marriages, age and family status, occupation, sharing of dwellings, custom, location, consumer tastes and preferences, and the buyer's financial status. Students of farm land tenure may be surprised to learn that the subject of urban land tenure also is regarded as an aspect of demand.

The supply side of the picture is considered and developed in the chapters on "The Construction Industry," "The Building Pro-

cess," "Urban Land Credit," and "The Home Mortgage Market". As these chapter titles indicate, the author carries his discussion of the supply factors far beyond a consideration of the physical supply of urban land and the costs immediately associated with land development. Cyclical factors and movements, building costs, credit costs and terms, and the intricacies of the home mortgage market all help to explain the supply situation. The interaction between the dynamic forces of supply and demand is the subject of the chapters on the "Urban Land Market Functions and Organization" and "The Housing Market."

The discussion of "Land Income and Value" that follows these two chapters should be of particular interest to economists. In it, the author briefly treats the subjects of price, land utilization costs, value and valuation, and rent. Most of the space is given to the development of a concept of urban land rent. Urban land is regarded as a joint product in which the elements of capital and land are "inextricably mixed." The classical concept of rent as a residual, as "the waste that the enterprise can support after paying a return on the nonwasting capital" (p. 361) is regarded as unacceptable. The concepts of rent as a monopoly return and as surplus income ("the difference between costs of production including entrepreneurial return and the selling price of the product"—pp. 364-65) are also rejected. Ratcliff defines rent as "a return to land for the contribution it makes in creating want-satisfying goods and services" (p. 365). Urban land rent is determined by supply and demand in terms of opportunity costs. It is a part of price and over the long run competition can be expected to keep entrepreneurial rents in line with economic rent.

The discussion of land income and value lays the groundwork for the author's treatment of the subjects of urban land use and city growth. These are discussed in the chapter on "City Growth and Structure." Consideration is given in this chapter to competition of uses, situs or location factors, and to the specific factors that influence the location of various types of retail establishments.

Chapter 14 deals briefly with a variety of "Urban Land Policies," including city planning, zoning, subdivision control, taxation and urban redevelopment. This is followed by two chapters on "The Economics of Housing Policy." They deal with the nature of the housing problem, the control of instability, reducing the costs of shelter, and means for handling the problems of substandard hous-

ing conditions. The analysis in these chapters is interesting and commendable but at the same time seems to stand out as an appendage to the rest of the book.

Looking at the book as a whole, one must admit that it has many merits. It is a fat volume, is well written and very readable. The approach is new and somewhat different from that employed in standard textbooks in general land economics. The author has made a very real contribution in drawing together many of the concepts of his field. Many sections of this book, such as his account of the building cycle in Chapter 7, his analysis of the "filtering-down" process in his chapter on "The Housing Market," and his discussion of housing costs in Chapter 15, are particularly commendable.

In the eyes of this reviewer, the book has many good and praiseworthy characteristics, but also some aspects that are subject to criticism. Some of the data reported, as in Tables 23, 24 and 25, seem to be strangely out of date in 1949. The various chapters are well documented but their value for class purposes could probably be improved by the addition of a bibliography or a listing of selected references at the end of each chapter.

As one might expect, most of the analysis and discussion centers around the problem of urban housing and space for housing. Professor Ratcliff is to be commended for the attention he gives to commercial and industrial land uses. He could have improved his over-all treatment, however, had he given more than a page and a half to the discussion of the use of urban lands for streets, parks and other public and semi-public uses.

The greatest weakness of this book lies in the limited emphasis it gives to the basic and underlying economic principles that affect land use. In his various chapters the author shows considerable ability in using economic tools of analysis, but on the whole he tends to overemphasize the institutional aspects of the field to the neglect of the economic aspects.

The book is described by the publisher as "a foundation work which is fundamental but not elementary." In this sense the author may be justified in assuming some reader-awareness of a number of economic concepts. As a class textbook, however, too much is probably assumed concerning the average student's awareness and understanding of the basic concepts and theory of land economics. This reviewer feels that more than passing mention or consideration should be given to the concepts of intensity of land use, the

principle of diminishing returns, ripening and supercession costs, the property valuation process, and the concept of fixity of investments in landed property. Mention should at least be made of the operation of the principles of comparative advantage and first choice. Also much more space should be given to the subject of property valuation and appraisal. The capitalization approach to valuation is very briefly discussed and little, if anything, is said about the market analysis and cost of reproduction approaches that are so commonly used in urban land appraisals.

RALEIGH BARLOWE

Michigan State College and Bureau of Agricultural Economics

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- *Ratcliff, Richard U., "Urban Land Economics," New York: McGraw-Hill Book Company, 1949. Pp. 533. \$5.50.
- *Vaughan, Lawrence M., and Hardin, Lowell S., "Farm Work Simplification," New York, New York: John Wiley & Sons, 1949. \$2.80.

* Reviewed in this issue

NEWS NOTES

The book "Readings on Agricultural Policy" published by the Blakiston Company is now available (See advertisement in this issue.) This book is the result of action taken by the American Farm Economic Association at its 1947 meeting when it approved a proposal of the Executive Committee that the Association undertake to publish reprints of articles in various fields of agricultural economics. The Editorial Council of the Association selected agricultural policy as the field for the initial volume and invited O. B. Jesness to assume responsibilities for editing the volume.

Martin A. Abrahamsen has re-joined the Cooperative Research and Service Division of Farm Credit Administration as principal agricultural economist in charge of the Cooperative Purchasing Section. For the past four years Dr. Abrahamsen has been professor of agricultural economics in charge of research and teaching in marketing at North Carolina State College.

Henry A. Allpress has accepted an appointment in Rural Economics at the University of Nebraska. His present work is on poultry and egg marketing.

M. E. Andall of the Saskatchewan office of the Economics Division, Federal Department of Agriculture, has returned after having been on leave for the academic year to pursue graduate work at Michigan State College.

Norris J. Anderson, formerly Professor of Agricultural Economics at Kansas State College, is now Extension Economist at the University of Nebraska.

G. M. Beal, Professor of Marketing in the Department of Agricultural Economics and Marketing at the University of Maryland, has been made Head of the Division of Marketing in the Department.

Karl Brandt, economist and professor of agricultural economics of the Food Research Institute of Stanford University returned April 10 after a year's sabbatical leave during which he lectured at Heidelberg, Gottingen and Geneva Universities and travelled extensively in Germany, France, and Italy.

Harley M. Brewer, of the Agricultural Estimates staff of the Bureau of Agricultural Economics, has been in Kansas helping with a pre-harvest wheat survey similar to those made in the late 1930's and the early 1940's.

Owen L. Brough has been promoted to assistant professor at Iowa State College. His major field is livestock marketing.

W. Herbert Brown, recently at Harvard University, has joined the Farm Management staff of the Bureau of Agricultural Economics and has been assigned to the Farm Costs and Returns section.

Arthur C. Bunce, who has been Economic Advisor to the Commanding General of South Korea with the rank of minister, has recently been assigned to the position of Chief of the Economic Cooperation Administration in South Korea.

R. P. Callaway, formerly Professor of Agricultural Economics and Extension Marketing Specialist at the University of Maryland has joined the staff of the Potato Division, Fruit and Vegetable Branch, Production and Marketing Administration, U.S.D.A.

James P. Cavin, Head of the Division of Statistical and Historical Research, Bureau of Agricultural Economics, is with the Paris office of the Economic Cooperation Administration, where he is working on East-West trade problems. He will return to the Bureau in September.

Edward C. Collins has joined the staff of the Fruit and Vegetable Section of the Cooperative Research and Service Division of Farm Credit Administration as associate agricultural economist. Mr. Collins has been employed for the past two years as assistant professor of economics at North Carolina State College.

Albert R. Conley, student and research worker in the graduate school at Ohio State University, has been appointed associate professor of agricultural economics at the University of Missouri and will assume his duties there on September 1. He is filling a vacancy left by the resignation of Dr. E. H. Matzen, who joined the Farm Credit Administration last winter. Mr. Conley is completing his work for the Doctor of Philosophy degree at Ohio State University.

Ivan L. Corbridge joined the Agricultural Economics staff of the State College of Washington, January 1, 1949, as Assistant Professor and Assistant Agricultural Economist. His duties involve research and teaching in marketing.

Rex Daly has returned to the staff of the Bureau of Agricultural Economics. He has been with the Illinois Agricultural Experiment Station where he worked on a Research and Marketing Administration project which dealt with methods of measuring farm expenditures and income.

Miss Loa E. Davis joined the Division of Agricultural Economics, Extension Service, U.S.D.A., in May to assist with marketing projects in consumer education conducted under the Research and Marketing Act. Miss Davis was in Washington with the Extension farm labor program in 1945 and since then has been attending Teachers College, Columbia, and serving as home demonstration agent in Frederick County, Maryland.

J. S. Davis, director of the Food Research Institute of Stanford University, returned June 10, after having spent ten weeks at the Institute for Advanced Study in Princeton, New Jersey, and ten weeks in the spring on an observation tour of the southern states.

Walter King Davis, a recent graduate of the Florida College of Agriculture, has joined the staff of the Cooperative Research and Service Division, Farm Credit Administration, as junior agricultural economist.

J. M. Dawson and M. Rachlis, who have been on leave of absence for further graduate work at the University of Illinois and Purdue University, respectively, have returned to their duties in the Economics Division, Dominion Department of Agriculture, Ottawa.

R. J. Doll, Kansas State College, is a visiting professor at the University of Arkansas for the first summer session. He will teach courses in Agricultural Policy and Agricultural Economics.

Phil S. Eckert, formerly head of the Department of Agricultural Economics and Rural Sociology, Montana State College, resigned last December to accept a position as specialist in the field of international exchange of agricultural commodities with the Economic Cooperation Association. Dr Eckert is stationed in Paris and travels throughout the sixteen cooperating nations.

Paul A. Eke, Head of the Department of Agricultural Economics at Idaho, returned July 1 from a year of sabbatical leave. He spent his leave in writing and study at the University of Chicago and travelling in European countries.

William H. Fippin has resigned from the staff of the Bureau of Agricultural Economics to accept an appointment in the Foreign Service of the State Department as chief of agricultural training for the American Mission in Korea.

H. C. Filley retired as Chairman of the Department of Rural Economics at the University of Nebraska on July 1, and will leave the University to enter other work September 1. His successor is Dr. C. Clyde Mitchell who has recently been working with Dr. Black at Harvard.

Walter U. Fuhrman has transferred from the Department of the Interior to the Bureau of Agricultural Economics, where he serves as leader of the Western Agricultural section, Division of Farm Management and Costs

Marshall Godwin, who has just completed work for a Ph.D. degree at Cornell University, has been appointed Associate Professor in the Department of Agricultural Economics and Marketing at the University of Maryland. Dr. Godwin will teach courses and conduct research in fruit and vegetable marketing.

George H. Goldsborough has re-joined the Cooperative Research and Service Division of Farm Credit Administration as senior agricultural economist in the Fruit and Vegetable Section. He has been employed for the past year with the Rural Electrification Administration

Wade F. Gregory, formerly of Pennsylvania Agricultural Experiment Station has accepted a position at the Alabama Agricultural Experiment Station as assistant agricultural economist in charge of a Feed Utilization Study. The project is jointly supported by the Station and Bureau of Agricultural Economics.

Ernest Grove of the staff of the Bureau of Agricultural Economics has received a Ph.D degree from the University of California. His dissertation is on income parity for agriculture.

Clifford M. Hardin has been appointed Director of the Agricultural Experiment Station, Michigan State College, effective July 1, 1949, to succeed Director V. R. Gardner, who retired at that time.

H. R. Hare, formerly Agricultural Advisor, Employment Service, Department of Labour, Ottawa, has been appointed Superintendent of Farm Development, Soldier Settlement and Veterans Land Act, with headquarters at Ottawa.

Charles W. Hauck is now in charge of the Fruits and Vegetables Marketing Section, Division of Agricultural Economics, Extension Service, U.S.D.A. He has been stationed in Washington since February 1949, hav-

ing transferred to this post from Ohio State University, where he was engaged in research and teaching in the marketing of fruits and vegetables from 1926 to 1949

Cecil B. Haver has returned to North Dakota Agricultural College after a quarter's leave of absence granted him to complete his Ph.D. work at Iowa State College.

G. V. Haythorne, Research and Statistics Branch, Department of Labour, Ottawa, recently completed requirements for a Ph.D. degree at Harvard University.

Jimmy S. Hillman, Assistant Professor, Department of Agricultural Economics, Mississippi State College, has been on leave doing advanced work at the University of California and will continue on leave during the coming academic year.

E. C. Hope, formerly Professor of Farm Management at the University of Saskatchewan, has been appointed Economist for the Canadian Federation of Agriculture with headquarters at Ottawa.

S. C. Hudson, Economics Division, Dominion Department of Agriculture, Ottawa, has been elected President of the Canadian Agricultural Economics Society for the coming year. Hadley VanVliet of the University of Saskatchewan is vice-president. The Councillors are I. S. MacArthur, A. H. Turner, W. D. Porter of Ottawa, and C. C. Spence of Edmonton, Alberta.

Buis T. Inman has been appointed assistant head of the Division of Land Economics, Bureau of Agricultural Economics, as well as leader of the field work of the Division.

Hilhard Jackson has been appointed Assistant Professor of Rural Economics and Sociology, University of Arkansas, effective August 1. Mr. Jackson attended the Regional Agricultural Marketing School, North Carolina State College, during the summer and was formerly employed jointly by the University of Arkansas and Bureau of Agricultural Economics.

E. Jaska recently joined the staff of the Economics Division, Dominion Department of Agriculture, Ottawa. For the past 15 years Dr. Jaska, a native of Estonia, has done research in agricultural economics at the Universities of Tartu and Jenna and has edited economic journals in Tallinn, Estonia.

Harold R. Jensen has been promoted to assistant professor at Iowa State College. His major field is farm management and production economics.

Hugh A. Johnson, a member of the Farm Management staff of the Bureau of Agricultural Economics since 1941, is now an agricultural economist at the Agricultural Experiment Station, Fairbanks, Alaska. He has recently been located at Purdue.

Earl L. Johnston, formerly with the Division of Agricultural Relations, Tennessee Valley Authority, has joined the North Carolina Agricultural Extension Service staff as Marketing Specialist in the Department of Agricultural Economics.

C. Del Mar Kearn has accepted a position as Assistant Professor in

Farm Management in charge of Farm Cost Account work at Cornell.

M. M. Kelso, Professor of Ranch Management at Montana State College, has been designated head of the Department of Agricultural Economics and Rural Sociology and of the Department of Economics and Sociology. He fills the position left vacant by the resignation of Dr. P. H. Eckert, formerly head of the two departments.

J. W. Kirkbridge is transferring from the Kentucky office of Agricultural Estimates to the Washington office of the Bureau of Agricultural Economics.

G. E. Korzan, Assistant Professor of Marketing in the Department of Agricultural Economics and Rural Sociology at Montana State College, has resigned that position to accept a similar one at Oregon State College.

Baldur H. Kristjanson received his Ph.D. degree from the University of Wisconsin in June and has been promoted to the rank of Associate Professor of Agricultural Economics at North Dakota Agricultural College.

Charles N. Lane, Agricultural Economist with the Economic and Credit Research Division of the Farm Credit Administration, has recently joined the staff of the Central Project Office in the Agricultural Research Administration, Washington, C. D.

L. C. Lanford is teaching two courses in Agricultural Economics at the Abraham Baldwin Agricultural College, Tifton, Georgia.

J. Lattimer, Department of Farm Economics, Macdonald College, has been elected a Fellow of the Agricultural Institute of Canada.

Jerry M. Law has been appointed as cooperative agent on southern regional poultry and egg marketing work and will be located at the University of Arkansas, Fayetteville. He had been on the staff of the Department of Agricultural Economics, Louisiana State University.

John E. Mason, for the last 2 years a member of the Farm Management staff of the Bureau of Agricultural Economics, died June 10 at the age of 40, following a week's illness. A native of Tennessee, Mr. Mason had been employed in the Department of Agriculture at various field stations and in Washington for 12 years.

Michigan State College students have organized a student section of the American Farm Economics Association. Dr. Arthur Mauch and Dr. Karl A. Wright of the Agricultural Economics Department are the faculty advisors.

George Montgomery has returned to Kansas State College to resume his work as Head of the Department of Economics and Sociology. He has been doing graduate work at the University of Minnesota.

R. G. Murphy has resigned his position as acting Assistant Professor of Farm Management Extension at Cornell University, and will continue in graduate work at Cornell to complete requirements for a doctor's degree.

R. A. Murray has resumed his duties as Professor of Agricultural Economics at State Teachers College, Platteville, Wisconsin, after completing requirements for a Ph.D. degree in Farm Management at Cornell University.

Max Myers is expected to return to the Agricultural Economics Department of South Dakota State College in September, after receiving the Ph.D. degree at Cornell University.

Claude Nash retired from active duty in the Department of Agricultural Economics at Michigan State College on June 30, 1949. He was Extension Specialist for 18 years in agricultural marketing following 15 years as County Agricultural Agent.

Ottar Nervik received his Ph.D. degree in Economics at Harvard University in July and is now affiliated with the Economics Department of South Dakota State College.

Arthur G. Peterson has returned to the Munitions Board, Office of the Secretary of Defense as Chief of the Textiles, Forest and Agricultural Products Branch, after spending nearly a year as Chief of the Statistics Division of the National Economic Board in Seoul, Korea.

Homer S. Porteus, formerly county agricultural agent in Ohio, has joined the staff of the Division of Agricultural Economics, Extension Service, U.S.D.A., as extension economist in marketing.

Winston E. Pullen, Assistant Professor of Agricultural Economics and Farm Management at the University of Maine, will be on leave of absence for the coming academic year to pursue graduate study at Cornell University.

Philip M. Raup has joined the Land Economics staff of the Bureau of Agricultural Economics as a cooperative employee with the Wisconsin Agricultural Experiment Station. He recently returned from 3 years in Berlin with the Office of Military Govt.

John C. Redman will be on leave from Mississippi State College during the coming year, doing advanced work at the University of Kentucky.

Fred B. Saunders, who received his Master's degree in Agricultural Economics, in June 1949 at the University of Georgia, has accepted a position at the Berry Schools, Mount Berry, Georgia, where he will teach courses in Agricultural Economics.

Rainer Schickele of North Dakota Agricultural College has been elected Chairman of the Northern Great Plains Tenure Committee of the 1949-1950 term.

Leonard Schruben has joined the staff at Kansas State College and will be in charge of the work in grain marketing.

Raymond C. Scott has been appointed Associate Professor in the Department of Rural Economics and Rural Sociology at Ohio State University and Ohio Agricultural Experiment Station. He will work in the field of fruit and vegetable marketing, research and teaching.

Geoffrey Shepherd returned in the middle of June from six weeks in western Germany. He assisted the Bipartite Control Office, Food and Agriculture Group, at Frankfurt, and western German agricultural economists and officials in developing a long-range price policy for western German agriculture.

Professor Edward A. Duddy of the School of Business, University of Chicago, has a file of the Journal of Farm Economics, 1924-1948, with the exception of two numbers missing which he will sell for \$50.00.

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CANADIAN AGRICULTURAL PRICE PROBLEMS AND POLICIES: A COMMENTARY

W. M. DRUMMOND
Ontario Agricultural College

THIS issue of the Journal contains several articles which deal in considerable detail with some of the more significant Canadian market and price regulating programmes. The specific programmes selected are, generally speaking, currently operative and of fairly recent origin. While the list chosen constitutes only a major sample of existing programmes and makes no attempt to include those which have been attempted at various times in the past, it does serve to illustrate the variety of approach adopted as well as the special and general character of the problems encountered and principles employed. The present paper is intended to act as more or less of a supplement to the other articles. Instead of discussing any particular programme or programmes as such, it aims at drawing attention to certain general factors or influences which help to explain why certain policy choices have been made. To a considerable extent it is a statement of the general underlying influences at work, the general methods used and the general results obtained. Its central thesis, if such it may be called, is that the special attempts which Canada has made to influence agricultural prices, either directly or indirectly, have been in large measure dictated by the special set of influences and circumstances which have prevailed. This is not to say that the steps taken were the only ones that could have been taken in every case. All that is suggested is that there has been a pronounced correlation between the special situations in which Canada has been placed and the kinds of action programmes decided upon. While this is likely to

be true to some degree of every country, it has been particularly so in the case of Canada.

The Dependence on Exporting

The large scale dependence on export markets is undoubtedly the most important of the several underlying factors conditioning Canadian policy. While this dependence has always been most pronounced in respect to wheat (around 70 per cent of production had to be exported), it has been very marked in the case of several other major products. It has always been necessary to export significant percentages of livestock and livestock products and such things as apples, potatoes and tobacco. Indeed there are very few products which have not been on an export basis to some degree at certain seasons at least. Whatever the situation regarding any specific product, a very large part of the total of Canada's agricultural production must find an export outlet.

This dependence on exporting leads naturally to several conclusions in respect to price policy. The first is that Canadian farmers as a class must be prepared to accept prices in line with those available in the world outside. Under normal conditions Canadian prices must tend to coincide with world prices. A second conclusion is that, so far as the great bulk of Canadian production is concerned, it is impossible to raise the price merely by imposing a protective tariff since importation does not normally occur. In the third place, the necessity of finding large export markets will virtually compel Canadians to keep costs and prices as low as possible in order to ensure success in international price competition. Also, any hope of price improvement lies in the direction of demand expansion rather than supply contraction. It is for this reason, of course, that any general policy of production curtailment of Canada's major products must be considered as part of an international policy. Finally this conclusion regarding the desirability of expanding demand rather than contracting supply tends to emphasize the wisdom of supporting every programme that seems calculated to maintain or expand demand. This goes far to explain why Canada has given such active support to the international trade agreement programmes both pre- and post-war, why she has been so anxious to consummate definite export contracts, and why her farmers have recently been so strongly behind the international commodity agreement idea. In the final analysis the strongest motivating force

in Canadian policy-making today is probably the belief amounting to a conviction on the part of those at the top level—in both government and farm circles—that it is not possible for agriculture or any other section of the body economic to secure satisfactory prices or levels of prosperity in the absence of an internationally expanding economy.

Relative Importance of Agriculture in the Economy

Even though the large dependence on exporting makes it necessary to think in terms of selling at world prices, Canadian farmers might well receive the equivalent of considerably higher prices were the non-agricultural sections of the economy capable of contributing sufficiently to this end. Price additions might take the form of supplementary payments or direct or indirect subsidies. In any such programme, however, it is obvious that the extent of the contributions on behalf of agriculture must depend upon the relative importance of the agricultural industry in the national economy. If agriculture were a relatively insignificant part of the total picture it might receive sizable contributions from the non-agricultural sectors without seriously affecting the income status of the latter. The truth of the matter is, however, that, regardless of the basis of measurement used, agriculture represents a very large part of the country's economic life even though its relative importance has been decreasing in recent years. To provide Canadian farmers with anything really significant in the way of price assistance would require an extremely large total contribution and much more than the rest of the economy could afford or be expected to give. Just how much it could afford is something that is extremely difficult to decide except in the most arbitrary sort of fashion. One possible indication of the limited extent to which agricultural prices might be added to in this way is seen in the total amount of funds provided for price stabilization operations under the Agricultural Prices Support Act.¹ That Act provides for a revolving fund of 200 million dollars. When it is remembered that this amount has to finance the price stabilization operations of all products other than wheat; that during the transitional period in which the Act was intended

¹ 8 Geo. VI, c. 29, An Act for the Support of the Prices of Agricultural Products during the transition from War to Peace, Assented to Aug. 15, 1944. For details of operations under this Act see the article by A. H. Turner in present issue of this Journal.

to be operative the government did not anticipate additional expenditures in respect to wheat; that it was apparently not thought possible or desirable to make even this amount available for more than a limited period; and that the implementation of this stabilization programme tended to coincide with the elimination of other previously-existing agricultural price subsidies, one can get some idea of its price-supporting value. So long as the number of commodities requiring price assistance is small enough and the period during which the assistance needed is short enough the amount of funds provided can render a real degree of price support.² The situation would be very different, however, were a general and severe drop in demand to occur making it necessary to support the prices of all or a large number of commodities simultaneously and for extended periods. Just how far 200 million dollars would go in raising prices under such circumstances can perhaps best be realized by comparing this figure with the total income from farm products exclusive of wheat in recent years.

This apparent fact that the national economy simply cannot afford to support farm prices to more than a very limited extent has several important implications from the standpoint of price policy. Perhaps the most important of these is that, in periods when prices in general are low, there would appear to be no possibility whatever of the Canadian government undertaking to keep farm prices at parity levels as has been done in the United States. There would simply not be enough money forthcoming to make this possible. For the same reason it would not be possible to ensure prices in line with cost of production as in the United Kingdom. This is probably another way of saying that Canadian farm price floors will probably have to be kept at relatively low levels for purely financial reasons. Another important point is that, under anything like emergent conditions, the Canadian price authorities may well be forced to choose between spreading the available funds over a long list of products or restricting their price support aid to one or a few key products particularly susceptible to price depression. Anyone familiar with the various types of governmental assistance given to Canada's wheat-producing enterprise from 1929 on cannot but be impressed with the extent to which the use of funds may have to be concentrated.³ In that case an absolutely key enterprise in

² *Ibid.*

³ For a full description and well considered opinions regarding these activities readers should consult the following articles: *Public Policy in Relation to the Wheat*

the agricultural and general economic structure was in special need of help partly because it was subjected to abnormally adverse weather conditions; partly because the commodity concerned was universally produced and was characterized by a highly inelastic demand; partly because such a large percentage of the product had to be exported, and partly because the producers were so largely dependent on the income from a single commodity. Still another consequence of this limited supply of price-support funds is the necessity of using the funds in such a way as to obtain the greatest possible price-raising benefits. Moreover, since the funds are likely to be small in proportion to the price-supporting requirements, particular care may have to be taken to see that the methods of raising and spending them are the most justifiable methods in the minds of contributors. It might well be, for example, that the latter would be more willing to support a food allotment plan aimed at raising the nutritional levels of low-income consumers than one designed to give direct cash payments to farmers. Whether a given expenditure on a food allotment programme would have a greater net effect in supporting farm prices than direct cash payments to farmers would also have to be seriously considered.

Specialization and the Dominance of Wheat

As is well known the specialized production of spring wheat in the three Prairie Provinces has long been a major enterprise in Canada's agriculture. The reasons for this specialization are too familiar to the readers of this Journal to require reiteration here. Suffice it to say that the soil and climate combined with the natural topography of this area provide an unusual opportunity for efficient production of a high quality product and, in considerable sections of the area, apparently do not invite favourable alternative opportunities. The general result is that, for the area as a whole, receipts from the sale of wheat have long formed and continue to form the main source of farm income. It is not surprising, therefore, that the farmers in these provinces have been particularly concerned about wheat-marketing methods and wheat prices. Speaking summarily it may be said that for the first three decades

Market by H. L. Griffin in the Canadian Journal of Economics & Political Science, Aug. 1935; *Observations on Canadian Wheat Policy since the World War* by H. S. Patton in the May 1937 issue of the same Journal; *Wartime Wheat Policy in Canada* by H. S. Patton in the Nov. 1942 issue of this Journal; *Dominion Aids to Wheat Marketing, 1929-39* by V. C. Fowke in the Aug. 1940 issue of Canadian Journal of Economics and Political Science

of the present century farmer effort was concentrated on finding ways and means of obtaining the largest possible part of the world price at which the wheat finally had to be sold.⁴ During the 1930's emphasis shifted to ways and means of maintaining the marketing methods that had been developed and securing from the federal government sufficient financial aid to provide at least a semblance of security and stability. In very recent years the real drive has been in the direction of a reasonable degree of price and income stabilization.

It is important to note that throughout this half century of uninterrupted effort governments, both provincial and dominion, have been called upon to render assistance. The assistance given has varied all the way from the appointment of Royal Commissions, provision of grain-marketing legislation, providing loans for the construction of farmer cooperative elevator systems, actual building and operating of country and terminal elevators, guaranteeing bank loans for cooperatives, undertaking large scale purchase of wheat futures in an attempt to prevent wholesale price reductions, guaranteeing minimum prices for wheat, making cash grants in specially distressed areas and, in recent years, undertaking to market all the wheat under government auspices and arrange annual or longer term contracts for the sale of wheat. This extensive degree of governmental intervention has not been undertaken without good reason. For one thing it must not be forgotten that the successful and large scale development of agriculture in the Prairie Provinces has long been regarded by successive Canadian governments as an absolute prerequisite of general Canadian prosperity. To a very large extent an economically healthy condition on the part of western Canadian farmers has been regarded as the best, and indeed only, assurance of prosperity throughout the nation. Western development was deliberately sponsored by the government not only because it was expected to supply a field for investment and business for those providing financial and transportation services but also because a major market was needed for industrial goods manufactured in the older Central Provinces.⁵ In the second

⁴ For a complete and chronological account of the development during these years see *Agricultural Cooperation in Western Canada* by W. A. Mackintosh, published in 1924 by the Ryerson Press. Also, *Grain Growers' Cooperation in Western Canada* by H. S. Patton, Harvard Univ. Press, 1928.

⁵ See address entitled "Western Agriculture in the Canadian Economy" by W. A. Mackintosh in Proceedings of the Conference on Markets for Western Farm Products, Dec. 12, 1938. Obtainable from King's Printer, Govt. of Manitoba, Winnipeg.

place the very fact that dependence on wheat in the West has been so pronounced has resulted in a special need and demand for government assistance. The need has been great because wheat producers were a long distance from their final market; because, being specialized, they have been unable to spread their risk; and because the demand for wheat is extremely inelastic. The demand has arisen partly because specialists are naturally more interested in the marketing of their special crop than general farmers are in the marketing of any one of their several products; partly because producers felt themselves subjected to glaring marketing abuses and completely lacking in bargaining power; partly because they have realized the government's dependence on their political support, but mainly because they have encountered severe economic adversity.

In view of the current Canadian interest in agricultural price stabilization, it may be in order to indicate the special interest of the wheat growers in the concept together with the basic reason for this interest. The wheat growers have pioneered the way, supplied the real spark and applied consistent pressure in respect to price stabilization. While there are probably several reasons for this, including their large numbers and effective organization, the main one undoubtedly is that they, more than any other group in Canadian agriculture, appreciate the possible maleffects of extreme price instability. Moreover the experience during the early 1930's has convinced them and the government as well that, under conditions of drastic and persistent price decline, it is entirely impossible to operate a pooling plan in the absence of a minimum price guaranteed by the national government. Since pooling does serve to mitigate seasonal price fluctuations the great majority of producers have been anxious to maintain this principle in operation.

If the experience in the early depression years proved the necessity of government financial help in order to preserve pooling, it also made it clear that even the national government was unable to raise minimum prices above very low levels. The knowledge that there are definite and early limits to the degree of price support which Canada unaided can give is at least partly responsible for this country's readiness to participate in such undertakings as the four-year wheat contract with Britain or the recently negotiated international wheat agreement. This willingness represents a hope that what she cannot hope to do alone she may be able to do with the aid of other countries. There is, of course, another and very important consideration which undoubtedly helps to explain why

Canadian governments have been willing to experiment with various methods aimed at giving wheat producers a greater degree of economic stability. It so happens that the basic character of Canada's resources virtually compels her to undertake large scale production of a few products which have to be disposed of, for the most part, in foreign markets. Moreover they are products which are particularly susceptible to immediate and pronounced drops in demand if and when international economic conditions become unfavourable. The general result is that the economy as a whole has been found to be inherently unstable. In view of this and because of the truly integral position which the wheat production enterprise occupies and because it is in many ways the most exposed and unstable of all Canadian activities, any programme that seems likely to ensure a greater measure of stability in that sphere has been looked upon as being in the national interest. Furthermore the realization that a really serious drop in wheat prices if continued is bound to result in wholesale transference from wheat growing to production of farm products which other Canadian farmers are producing and for which there is only a limited market may help to suggest why the government has felt it was good business to devote a major part of its total stabilization effort to the wheat situation. The attempt to bolster wheat prices has been, to a very considerable degree, an attempt to bolster farm prices in general. Finally it may be said that anything in the way of price stabilization assistance which the government may find it possible to give is looked upon as something which may at least partially offset the price-raising effects of the national protective tariff policy to which the wheat growers have been particularly subjected.

— *Some Effects of the General Wartime Price Control Policy*

Throughout the period of the Second World War Canadian authorities enforced a programme designed to maintain specific relationships between certain prices and to prevent serious increases in the general price level. As is well known the implementation of this price control policy required large scale substitution of direct and arbitrary regulations for the control normally exercised by the price system. When the policy was instituted in September 1939 and for nearly two years after, farm prices were low in relation to prices of the things farmers had to buy. Moreover this general relationship had existed for many years prior to the war. Between

the start of the war and the application of the general price ceiling in the late autumn of 1941 the rise in farm prices, on the average, was comparatively small and the net price position of farmers had actually worsened. Despite farmer protests the actual prices were kept at or near the ceiling levels which prevailed at the end of 1941, although definite and sizeable increases were permitted in a few cases where continuance of existing prices would have meant obvious injustice. For the most part any additional economic inducements took the form of direct and indirect subsidies and it was not until after the war, when price controls and subsidy payments were gradually eliminated and the general world scarcity caused farm prices to rise, that farmers received much extra remuneration in the form of increased prices in the true sense. Moreover the general policy, when permitting price increases or granting subsidy payments during the war, had been to offer only that amount of inducement needed to obtain a desired volume of production.

While farmers benefited financially as the war period proceeded and as the volume of sales and amount of subsidy payments increased, they never became really reconciled to either the subsidy idea or the concept of a ceiling on their selling prices. Realizing that subsidy payments were bound to disappear and believing that the price control policy had prevented them from receiving anything like as much returns as they would have received under uncontrolled price conditions, and realizing also what had happened to the price of farm products after previous wars, farmers began to press for some degree of protection against future possible price declines. Their attitude is well illustrated by the following quotation: "If Canada can maintain a general price ceiling in wartime to save us from the disasters of out-of-hand inflation, our farm people believe that in the postwar period Canada can just as logically establish and maintain a general price floor to save us from equally disastrous deflation."⁶ This statement makes it fairly obvious that the farmers were thinking in terms of postwar compensation for something that had been denied them during the war. It also suggests not only that they believed it technically possible for the government to give this compensation but that to attain this result it was quite in order, if necessary, for the government to employ

⁶ From an address delivered in 1942 by H. H. Hannam, President of the Canadian Federation of Agriculture. The fact that this statement was made as early as 1942 is in itself significant.

marketing techniques and a degree of arbitrary regulation corresponding to that of the war period itself. Indeed the inference is that the postwar period might well constitute a peacetime emergency warranting any degree of governmental intervention that might be found necessary and useful.

At this point one might enquire as to the soundness of the logic in the quotation cited above. This seems desirable inasmuch as there has never been any doubt raised in regard to the matter so far as this writer is aware and because the success of specific programmes which may be partly due to its unquestioned acceptance might well depend on the validity of this basic claim. It is not possible, due to lack of space, to discuss the question here in any detail. One may, however, raise two or three questions. For one thing is it reasonable to expect that Canadians generally would actually submit to anything like the wartime degree of government regulation in order to meet a purely economic peacetime emergency? In particular would they submit to the wartime levels of taxation in order to provide funds for maintaining employment, purchasing power and farm prices? In the second place is it safe to assume that, in a period when "disastrous deflation" threatens, there will be as much national income available to bolster falling prices as there was in wartime to pay price subsidies? Of course the answer to these questions may be that no really pronounced degree of price support was ever contemplated and that the programme of financing would therefore be entirely feasible. Nevertheless these questions would seem to warrant some consideration.

Most of the special agricultural price support programmes thus far provided are outlined in some detail in other articles in the present issue of this Journal. They include the current four-year wheat agreement, the operations under the Prices Support Act of 1944, the recently-arranged plan for marketing coarse grains through the Dominion Wheat Board and the 1949 enabling legislation which gives provincial marketing boards the legal authority to operate in interprovincial and international trade.

In respect to the last-mentioned legislation it may be said that, ever since the federal Natural Products Marketing Act was finally declared unconstitutional in early 1937, organized agriculture has been making annual requests for something that would act as a substitute and the 1949 legislation has been designed for that purpose. Just what use will be made of it remains to be seen. The

insistent demand for such legislation, however, requires a word of explanation. The explanation is probably many-sided. Many of the commodities involved in the schemes which operated under the original Natural Products Marketing Act of 1934 and those more recently dealt with in schemes operated in some of the provinces are consumed mainly if not entirely in the domestic market. This might suggest that in some cases there has been a desire to raise the price by limiting the supplies offered for sale. One cannot but feel, however, that the central interest has lain in the possibilities of securing a larger part of the true supply and demand price. To this end quite a few of the schemes have attempted to secure whatever benefits collective bargaining may bring by arranging prices through negotiation. Where arranged in advance of production these negotiated prices have acted as forward prices as well. In other cases an attempt has been made to secure higher average prices by stressing more orderly marketing. In still other cases the emphasis has been on regulating the market in such a way as to raise the average quality, replace inefficient by more efficient methods, and generally reduce the marketing spread. Generally speaking it would appear that greatest success has been achieved where no really scientific market organization had previously existed, or where the products concerned were produced in limited areas and by relatively few producers or where the producers were strongly organized and ably led.

Much remains to be said regarding the influence of the general wartime price policy on war and post-war agricultural stabilization efforts. There can be no doubt, for example, that the mere implementation of that policy did much to condition the minds of farmers and governmental authorities as well to the stabilization idea together with the possibilities of its successful application. It is also true that farmers, by and large, were favourably impressed by the wartime practice of announcing definite prices well in advance of production. And it should not be forgotten that the wartime plan to encourage production of coarse grains, livestock and livestock products rather than wheat in the Prairie Provinces along with the determination to prevent increases in the cost of living index go far to explain why the government decided to take complete charge of wheat marketing in the autumn of 1943. At that time wheat futures prices were rising rapidly and would undoubtedly have risen much more had open market dealings been allowed to continue.

Effect of the "National Policy"

In 1878 the government of Canada adopted what has ever since been known as the National Policy. Its aim was the gradual development of a more balanced type of economy. To encourage secondary industries the government undertook to provide a very considerable degree of tariff protection. One general result of this policy has been that agriculture, which has, generally speaking, been unable to use the tariff to raise its selling prices, has had to pay prices for the industrial goods which were very considerably higher than would have prevailed in the absence of the tariff protection. The main significance of this circumstance from the standpoint of farm price policy is that farmers, in search of a net improvement in their price position, have felt impelled to place special emphasis on ways and means of reducing their buying prices. Price reduction has been sought partly through tariff reduction and partly through an expansion of cooperative purchasing. To some extent efforts have been made to offset the high prices with reduced transportation rates. Whatever the method, the point to remember is that reduction of the prices which farmers have to pay has been and still is a most significant part of farm price policy.

Some Final Observations

While the most important factors influencing price policy have probably been mentioned, there are undoubtedly others of some consequence. In particular, Canada's extreme and continued reliance on the British market has no doubt forced this country at times to adjust policies in line with British policies and requirements. For example, the adoption of fixed annual prices in the Canadian-United Kingdom contracts during recent years, while partly dictated by the special wartime needs, has also represented an adjustment to the bulk purchase policy advocated and practised by the present British government. Another entirely different sort of influence that might be mentioned is the great size of the country and the wide diversity of farming interests and enterprises. Whether a price policy should favour growing all the feed grain in the West or feeding as well as growing it in that area or aim at discouraging the growing of potatoes in Ontario and encouraging the growing of them in the Maritimes are among the many unsettled questions in the minds of Canadian policy makers. In connection with this matter the heavy transportation costs resulting from the tremendous haulage distances constitute a serious obstacle to rapid and effec-

tive geographical specialization. A final factor which exerts some influence over farm price policy is the particular attitude which has prevailed and the course which has been followed when dealing with the anti-combine problem. Canada's plan of action in this connection is in some respects unique. That, however, is a whole story in itself.⁷

In the light of the foregoing it may be of interest to note the most recent declaration of price stabilization policy of the Canadian Federation of Agriculture which is the official mouthpiece of organized agriculture. In this declaration prime emphasis is placed on the need of maintaining full employment and maintaining demand abroad as well as at home.⁸ While public works are advocated as a means to this end, it is seriously suggested that prices should be supported by subsidizing low income consumers. In fact details of a possible food allotment plan are provided and the view is expressed that no other means of support would be required in the case of products consumed domestically. For those mainly dependent on the export market price floors are recommended. Such floors, however, are regarded as simply one more line of defence. The parity price concept is also accepted and a specific Canadian method of calculating parity is outlined. Of special significance is the suggestion that the government should not undertake to pay floor prices that are more than 80 percent of the parity level. The reason for this is not that the government could not afford to pay more but rather that any higher price would encourage more production than could be disposed of and thus lead to production control measures. The general idea would be that the floor price should be high enough to protect the farmer against actual cash loss. Since it would not be sufficient to cover normal overhead as well, it seems evident that the floor price is being thought of as short run protection against the extremely low prices likely to prevail during a depression or emergency period. That this list of suggestions should be forthcoming during a period when most farm prices are at or near record levels is perhaps the best possible evidence that the various existing stabilization measures are expected to have a limited life at best.

⁷ For an authoritative account of Canadian anti-combine policy see *The Control of Competition in Canada* by L. G. Reynolds, Harvard Univ. Press, 1940. Additional information may be obtained in Report of the Royal Commission on Price Spreads, published 1935 by King's Printer, Ottawa.

⁸ A complete outline of these proposals was given by the Federation's economist, Dr. E. C. Hope, at the annual convention held last January. At this convention a resolution embodying the proposals was presented to and endorsed by the delegates.

FEDERAL MARKETING AND PRICE SUPPORT LEGISLATION IN CANADA

A. H. TURNER¹

Canadian Department of Agriculture

THE vast expansion of governmental control in the economic field which has taken place during the war is without parallel in the history of the world. Nobody doubts that in the difficult period of transition that must follow immediately upon the declaration of peace, some portion, at all events, of the control must be retained but on the question of how far similar control is appropriate as a permanent peace time policy, there is acute controversy."² Professor Pigou made the above statement at the end of the First World War. Government intervention in marketing of agricultural products is not new. For many years there has been controversy over the degree to which such control is desirable. The following opinions were expressed at the annual conference of the American Farm Economics Association held at Laramie, Wyoming in August 1949.

"The only way to avoid governmental controls over agricultural production in the effort to maintain farm income in relation to the income of other groups is to find some way of eating surpluses. Falling prices have often caused production increases instead of decreases."³

"Shall we look to the government to maintain a given price structure for agriculture indefinitely without regard to conditions in the market? If so, we cannot escape giving to the Government the controls of production and sale which are needed to make such prices effective."⁴

¹ Senior Economist, Economics Division, Marketing Service, Department of Agriculture, Ottawa.

The author wishes to express his appreciation to other members of the Department of Agriculture and to C. V. Parker of the Dominion Bureau of Statistics for their assistance in preparation of this article.

The article is intended to be mainly descriptive and does not attempt to appraise or analyse the impact of the program outlined except by occasional general suggestions.

² A. C. Pigou, "Government Control in War and Peace, p. 363, *The Economic Journal*, Vol. XXVIII.

³ *New York Times*, August 17, 1949. Press release of statement made by J. W. Fichter of Ohio State Grange.

⁴ *New York Times*, August 17, 1949. Press release of statement made by Dr. O.B. Jesness, University of Minnesota.

In this setting, a discussion of Canadian marketing and price support legislation will indicate the extent to which Canada has agreed to assist agriculture through governmental legislative marketing aids and by government action designed to lessen the instability of farm product prices.

Marketing Legislation⁵

Marketing legislation in Canada has been a matter of interest and discussion for many years and more particularly since World War I. Early legislation and marketing organization was related mainly to voluntary cooperative marketing, although the first Wheat Board in Canada was established during World War I.⁶ Appropriate legislation for grading and inspection of major agricultural products became general in the 'twenties. British Columbia had entered the field of greater regulation of marketing practices in 1927 and during the nineteen-thirties most of the provinces seriously considered or actually passed milk control legislation and regulations of one kind or another.

*Agricultural Products Co-operative Marketing Act, 1939*⁷—After the Federal marketing legislation known as the Natural Products Marketing Act was declared ultra vires of the Parliament of Canada in 1937, the government of the day decided to assist orderly marketing by the encouragement of pools which would return to the producer the maximum sales return for his product less a maximum margin for handling expense agreed upon in advance.

In 1939 the Government of Canada passed the Agricultural Products Co-operative Marketing Act and the Wheat Co-operative Marketing Act. The latter has only been used in one year but the former Act, which covers the marketing of all agricultural products except wheat, has been used to a greater or lesser degree from time to time during the intervening years.

The purpose of these Acts was to aid farmers in organizing and

⁵ For further details on Agricultural Marketing Legislation up to 1939 see *Agricultural Marketing Legislation*, Marketing Service, Department of Agriculture, Ottawa, 1939.

⁶ The marketing of wheat and the operations of the Canadian Wheat Board are described in another article of this series.

⁷ For further details about this Act, see W. F. Chown, "Agricultural Products Co-operative Marketing Act," 1939, p. 5, *Economic Annalist*, Vol. XVII, No. 1, Department of Agriculture, Ottawa.

administering marketing pools for the orderly marketing of their products.

The Government would undertake to guarantee a certain minimum initial payment to the producer at the time of delivery of the product as well as a margin for handling, with sales returns being made to producers on a co-operative plan. This objective was to be accomplished under the legislation by providing for the guarantee of initial payments made for any agricultural products up to 80 percent of the average of the previous three years' prices, the exact percentage to be recommended by the Minister of Agriculture, who would enter into an Agreement with the selling agency for the product. The payment to the producer was to be made through the sales agency on a graded basis at the time of delivery of the product. It is probably correct to say that voluntary co-operative pools, as contrasted with voluntary co-operative purchase and sales agencies returning patronage refunds, were few in number in Canada in 1939. This was partly due to the difficulties which confronted the Wheat Pools during the early 'thirties, following their high initial payment on the 1929 wheat crop.

According to the Act, a co-operative plan means an agreement or an arrangement for the marketing of agricultural products which provides:

1. for equal returns to primary producers for agricultural products of like grade and quality;
2. for the return to primary producers of the proceeds of the sale of all agricultural products delivered thereunder, produced during the year, after deduction of processing, carrying and selling costs and reserves, if any;
3. for an initial payment to primary producers.

When a farmer or rancher delivers products for sale on such a basis he surrenders title to the product and acquires in exchange a fractional interest in a pool and will receive exactly the same return as other participants for the same grade and quality.

Under the Act agreements may be made by the Minister with co-operative associations, processors of agricultural products or selling agencies authorized to act for one or more co-operative associations, one or more processors or one or more associations and processors. It has been usual to make agreements with a selling agency of the latter type if one marketer does not handle a substantial portion of the product in the area.

Agreements under this Act have been made with respect to the marketing of honey, onions, potatoes, oats, barley, flax, rye, corn, fox and mink pelts and the following seeds, alfalfa, crested wheat grass, western rye grass, timothy, red clover, alsike clover, sweet clover and peas.

Initial payments approved by the Minister of Agriculture have ranged from 30 to 70 percent of the average of the last three years' prices compared to a possible 80 percent authorized under the Act.

Thus far the Government of Canada has not suffered any loss under this Act except with respect to fox pelts, which product tends to be somewhat unpredictable with respect to its annual market, due to its dependence on the whims of fashion. Serious difficulties have accompanied the marketing of fox pelts since World War II, and even though initial guaranteed advances were relatively low as a percentage of three years' prices, some loss has been sustained.

This experience indicates that any service to agriculture rendered by this Act has been at relatively small expense to the taxpayers of Canada except for small administrative expenses, which in most cases have been taken care of as part of day-to-day administration of the Department of Agriculture. No additional staff has been acquired for the specific purpose of administering this Act.

It would appear that the Act has been or is expected to be of greater service at the present time since the number of agreements under it has increased in 1948 and will likely show a further increase in 1949, based on the number of applications or expected applications by the end of August 1949. One co-operative selling agency engaged in the marketing of seeds and servicing more than a dozen local co-operatives has used the Act each year since 1939.

In administering the Act, the Minister has required that, as far as possible, products should be marketed annually or in a shorter period of time, in order that pools might be closed out promptly. However, in a number of cases, stocks have been carried over for more than one year and in such cases the Minister has usually required that definite arrangements for the marketing of stocks carried over should be made before a new agreement is completed. This question of carry-over and the length of the marketing pool may be the one which will give the greatest administrative difficulty under this Act during periods of declining price levels. The government may find itself in the difficult position of having to

hold, through a selling agency, large stocks of products while, unless a new agreement is granted, the selling agency or some other agency representing similar producers may come into the picture and finance the current year's crop without government financial assistance and at the same time compete with sales of the product being marketed under government guarantee. The government has as its safeguard against such possibility the fact that it does not pay any deficiency which may arise in the pool until after the pool has been closed out and all of the product sold. Further, the financing agency (usually a bank) becomes an interested party and it is not likely that it will consider further financing of the crop since the Minister is given some discretionary powers with respect to the termination of any agreement. The financing agency will likely try to work with the government to obtain greater security in financing and marketing of the particular products in the future.

Another problem concerns the possibility of producers' groups attempting to use the Act for the purpose of price support. The government has made it quite clear that the Act is not intended as a means of supporting prices but for assistance in financing the orderly marketing of agricultural products on a voluntary pool basis. As long as the administration of the Agricultural Products Co-operative Marketing Act and the Agricultural Prices Support Act (which is described later in this article) are as closely related within the Department of Agriculture as they are at present, this problem is not likely to occur in any significant degree.

Agricultural Products Marketing Act, 1949—With the enactment of marketing Acts in most provinces, after the Natural Products Marketing Act, 1934 had been declared ultra vires of the powers of the Government of Canada, and the development of provincial boards and schemes under these Acts, as well as government export boards in wartime, little or no further pressure was placed on the Government of Canada to pass further marketing legislation of this type until after World War II. During the war years the government, with the cooperation of producers and trade organizations, handled the marketing of the main agricultural products under a system of wartime boards set up to direct the production and allocation of products, to handle export contracts, and to control prices.

As soon as World War II was over and government boards and controls began to disappear, producer groups again began urging

federal legislation with respect to organized marketing. Some of the wartime export boards have been continued and are still operating in the post-war period, under the authority of the Agricultural Products Act 1947, with the main purpose of handling and ensuring fulfilment of export contracts with other governments. This Act expires March 31, 1950. Depending on the basis of new export contracts the Government may at that time expect producers and the trade to have developed the necessary marketing organization to operate on their own behalf with the assistance of the agricultural marketing legislation which already exists.³ The Agricultural Products Marketing Act was passed in April 1949 and provided as follows:

"The Governor in Council may by order grant authority to any board or agency authorized under the law of any province to exercise powers of regulation in relation to the marketing of any agricultural product locally within the province, to regulate the marketing of such agricultural product outside the province in interprovincial and export trade and for such purpose to exercise all or any powers like the powers exercisable by such board or agency in relation to the marketing of such agricultural product locally within the province."

In this way it is possible through marketing boards to provide producer groups within a province with complete marketing control over any commodity produced in that province. This of course assumes that such producer groups desire this control and can have their scheme approved by their own province.

For example, if the poultry producers of Alberta wish to effectively control the marketing within the province of all or part of the eggs produced within Alberta, a board set up under the authority of its own provincial statutes could do so. By an application under the Agricultural Products Marketing Act, 1949, such Board could obtain an extension of its powers to give it complete control over the marketing outside of the province of all or part of the product produced within the province.

The Agricultural Products Marketing Act, 1949, does not give the local marketing board any greater control over agencies outside the province than is possible through the control of the commodity by the board and whatever contractual arrangements it may make

³ The long term marketing policy for grains, which is likely to remain under government control boards, is described in another article in this series.

with such agencies outside the province. However, it does give the board authority to take action or police those producing the product within the province and require them to handle the product in a certain manner when marketing outside the province.

Legal opinion suggests that this is about the limit of the authority of the Government of Canada to regulate marketing under the present Canadian constitution, unless it wishes to engage in the purchase and sale of the product.

To date the Governor-in-Council has extended certain specific powers bestowed upon the British Columbia Fruit Board and the Nova Scotia Marketing Board with respect to apples by their respective provincial legislatures. It is likely by the time this is read that the British Columbia Coast Vegetable Marketing Board will also have had approval of an extension of certain of its powers.

The Province of Ontario has a number of control schemes under its marketing Act, but it is doubtful if any extension of powers that would be of assistance is possible here, in most cases, since the boards set up in Ontario do not usually take actual control of the commodity. These Ontario boards simply arrange prices and other marketing practices by negotiation with the trade and make it illegal for the product to be handled otherwise within the province. It is doubtful that an extension of power to control producers shipping outside of the province could be enforced in a satisfactory manner, if a provincial marketing board does not offer to purchase, directly or through agents, the supply of the product which it wishes to control.

While the legislation is new, the general idea as has been noted above is anything but new. By providing this legislation, the Government of Canada has made it possible for producers to organize themselves into large scale selling and market control units, providing sufficient numbers agree voluntarily that this is the best scheme of marketing and that they meet the various other requirements laid down by the provincial legislatures.

Organized marketing boards of this type could make it possible for the Agricultural Prices Support Board, whose functions are described briefly later in this article, to render more effective assistance to agriculture. This would be possible since such Boards would provide a means whereby the Agricultural Prices Support Board may be approached when the need arises and also would be

helpful in handling any price support program where the deficiency payment method is used. A producers' board of this type would reduce to a minimum the amount of auditing and marketing supervision that would be necessary under a system of deficiency payments by the Board to producers. The producers' board would be interested in obtaining the best price possible for the product, even above that guaranteed by the Government, if at all possible, and thus would be working in the interest of the people generally by lowering any costs to the Government for assistance under price support programs.

Price Support Legislation

The objective of minimizing the effect of farm price fluctuations is not a post-war development in Canada. Assistance to agriculture has included many kinds of payments to aid in marketing, to give incentives for increasing or decreasing production, to help pay transportation costs and to provide price premiums for better quality products. Most of these federal schemes of price or income assistance have meant the voting by Parliament of special appropriations, or the enactment of continuing legislation relating to payments and special assistance for a particular commodity.

Canadian farmers are dependent on export trade. Any attempt to maintain their income at a relatively high level requires maintaining exports at 20 to 40 percent of agricultural production. Prices of agricultural products that enter international trade are highly sensitive to changes in foreign demand and monetary and other conditions affecting exchange rates. During the war, overseas contracts played a prominent part in Canadian agricultural price stabilization. A number of the government boards set up during wartime to carry out these contracts along with the necessary export and import controls have been continued in the post-war period under the authority of the Agricultural Products Act, 1947. Overseas contracts for agricultural products in 1949 (with the exception of grains) still handled by Government boards whose authority rests in the Agricultural Products Act, 1947, include those for bacon, cheese and eggs.

Agricultural Prices Support Act, 1944.—The Agricultural Prices Support Act was passed by Parliament in 1944 and represents a general legislative enactment to which producers of any agricultural commodity, except wheat, may turn if need for price assist-

ance can be established. At the present this Act is operative until March 31, 1950.

The administration of the Act is placed in the hands of a three-man Board, the chairman of which is an official of the Canadian Department of Agriculture, while the other two are representatives of Canadian agriculture. The Board has at its disposal a revolving fund of \$200,000,000. which is maintained at that amount by annual appropriations, if there is any loss during the year, and, if there is any surplus, it is turned over to the Consolidated Revenue Fund annually. The Board is "to endeavour to ensure adequate and stable returns for agriculture by promoting orderly adjustment from war to peace conditions and to endeavour to secure a fair relationship between the returns from agriculture and those from other occupations."

Unlike price support legislation in the United States, there is no historical price formula set out in the Act. The decisions as to the levels at which prices are to be maintained or the commodities whose prices are to be supported are left to the Board to recommend to the Government. In other words, there is nothing automatic about the Act and its application. However, it provides that the Board may recommend price support for any agricultural commodity, except wheat, which may be designated by the Governor-in-Council, including processed meat, dairy and poultry products.

The usual procedure is for representatives of the interested commodity group to make representations to the Board and after the Board has studied the situation and considered the need it will recommend to the Government that assistance be given or reject the application. It will also recommend, if the application is accepted, the prescribed price and the amount of assistance as well as the method of giving the support which it considers most feasible in the particular case. If the Government approves, then the support program will be put into effect by the Board.

In carrying out this procedure the Board usually takes into consideration:

1. Historical price patterns for the commodity concerned and price levels at which related commodities, if any, are being supported.
2. The basic cause of the price or income decline and the supply of the commodity.
3. The long term market possibilities for the product.
4. The problems of storage and disposal likely to be involved.
5. The relative efficiency of the producers concerned along with possible

alternative sources of income as well as the number of producers affected.

6. The implication of the precedents which are being established.

The Board, as a rule, prefers to have and may request the commodity group itself to suggest solutions to the problem on a long term basis. The ability and willingness of such group to carry out the suggested solutions is regularly appraised by the Board in considering its recommendation.

With this flexibility of operation, it is possible to use a variety of approaches with respect to solving the marketing problems relating to the different products that may require to be supported.

The Board can recommend assistance or support by either of two methods, in accordance with the Act:

1. Outright purchase.
2. Underwriting the market through guarantees or deficiency payments.

The latter method has been used to date only where marketing boards with experience in handling the commodity have been established by the commodity group concerned.

While outright purchase has been the general policy, there have been a number of variations in approaching such purchase, including the following:

- (a) An offer to purchase all of the commodity as produced and offered at a price fixed in advance of production.
- (b) An offer to purchase up to a limited quantity of the product and thus relieve the market of the surplus until a price adjustment takes place. This may involve the Board undertaking to withhold from the market the purchased portion of the commodity, at least temporarily.
- (c) The purchase of all offers of the commodity already produced between specified dates, usually towards the close of the marketing year.
- (d) The purchase of an additional quantity of a product for a buyer's account in order that a sufficient total quantity to relieve the surplus situation in the market may be removed, even though the buyer may obtain a bargain through receiving a larger quantity of the product at a discount price.

For the most part, the Board has not offered an overall price support program which would accept the product as produced for market, butter and cheese being the two exceptions. In the case of butter, the Board was continuing a policy which had been established earlier under wartime regulations and was also dealing with

a product which is normally consumed in its entirety in the domestic market. Temporary marketing adjustments, due to a previous short supply situation in butter and the introduction of margarine for the Canadian consumer with the uncertainties created seemed to require some stabilizing factor to protect the producer against extreme price fluctuations. In the case of cheese, a floor price was fixed in advance to December 31, 1949, in lieu of a Government commitment to purchase cheese throughout the 1949 cheese marketing year, in order to fill the contract with the United Kingdom. The cheese contract was filled earlier than anticipated and the Government has fulfilled its commitment by arranging for the Agricultural Prices Support Board to continue to purchase any cheese offered at the contract prices for the balance of 1949.

The Agricultural Prices Support Act, although passed in 1944, did not become operative until 1946. Since that time its operations have included assistance to a number of products under varying circumstances and at different periods of time.

Potatoes—In 1946 and 1948 assistance was given to the potato industry at a cost to the Government of approximately \$170,000 in 1946 and \$1,600,000 in 1948. In 1946, sales to the British Ministry of Food after the price support program had been established, relieved the market to a sufficient extent to require the Government to accept only a slight loss on the purchase of potatoes for re-sale to processing plants. These potatoes were purchased at \$1.50 for a 165-pound barrel (91¢ per 100 lb.) for field run potatoes containing at least 70 percent Canada No. 1 grade for re-sale to starch processing plants at \$1.00 per barrel (61¢ per 100 lb.). In 1948 the program was based on the purchase of potatoes in designated areas in the Maritime Provinces at \$1.15 per hundred pounds for Canada No. 1 grade potatoes held on farms after April 1, 1949, and no applications for purchase to be accepted after May 31, 1949. Less than three percent of the 1948 production of potatoes in Canada were purchased under this program, and towards the end of the purchase period, prices firmed in the market and the Government was able to re-sell some potatoes to the producers for the same price which they had received. In both years the support program was applicable only in certain parts of the Maritime Provinces, where the removal of some commercial surpluses stabilized the Canadian market generally.

Apples—In 1947, 1948 and 1949, the Agricultural Prices Support Board extended assistance to the apple growers in Nova Scotia and in 1948 and 1949 to the apple growers in British Columbia. For many years prior to the war, Nova Scotia apple growers had been shipping the bulk of their crop to the United Kingdom. This market was lost to them on account of the war and the Government has given some assistance in practically

every year since 1939, although it was not until 1947 that the Agricultural Prices Support Board entered this picture. In 1947 and 1948 the method of support consisted of a system of guaranteed prices, with the payment of any deficiency to the marketing boards in the provinces concerned being made after the apple marketing season was completed. In 1949 the Agricultural Prices Support Board has purchased through the British Food Mission in Canada an additional quantity of apples which it has given to the British Ministry of Food on a dollar for dollar basis up to a total amount of \$1,500,000. The apple price support program in 1947 cost approximately \$3,000,000 while that of 1948 cost in the neighbourhood of \$1,500,000, with most of the direct assistance going to Nova Scotia apple growers in each year. Indirect benefits of the program were received by all apple growers in Canada due to the support given surplus production areas.

Dried White Beans—In order to assist the growers of the 1948 crop of dried white beans, the Government, through the Agricultural Prices Support Board, purchased about 40,000 bushels of beans for refugee relief at a price of \$3.75 per bushel delivered to bean warehouses, plus necessary cost for processing, grading, bagging, loading, inland and ocean freight charges, at a cost of approximately \$195,000. In establishing this support program, a maximum limit of expenditure of \$200,000 was set. The Bean Growers Marketing Board of Ontario was successful in selling the balance of the product in the domestic or export markets.

Extracted Honey—In order to relieve a surplus resulting from a high production per hive in 1948 and the fact that overseas markets had not been regained for Canadian honey in the post-war period, the Board agreed to purchase up to 5,000,000 pounds out of a total production of 45,000,000 pounds of 1948 honey, offers to be accepted from May 15 to July 31, 1949. The Board actually received offers of only about 3,000,000 pounds, which it purchased at a cost of approximately \$350,000. Up to September 15, 1949, distribution and sales policy was limited to providing price quotations on request for quantities which could be exported from Canada.

Butter—On April 1, 1949, the Agricultural Prices Support Board offered to purchase butter produced in Canada at prices ranging between 57½¢ and 59¢ per pound for first grade butter, at various delivery points. By the end of August 1949, the Government had purchased in the neighborhood of 45,000,000 pounds of butter. During August the position had become sufficiently clear for the Board to announce a general price policy up to March 31, 1950. The selling price during the present support period, which ends on March 31, 1950, will not be less than cost plus storage charges. As soon as the Government announced this policy, the trade began to enter the market and make their own purchases and store some butter. However the Board will have most of the available butter to distribute during the short supply winter months.

Dry Skimmed Milk—In May, 1949 the Board announced a purchase program for first grade dry skimmed milk up to a maximum expenditure of \$1,000,000, prices to be 9.5¢ per pound for roller process and 10.75¢ per pound for spray process powder, f o b. country points. The Government

purchased the maximum amount under this program and still held the skim milk powder at September 15, 1949, although it is expected to transfer it for foreign relief purposes or sell it in export markets, in the near future.

Cheddar Cheese—On August 24, 1949, the Government announced that the Agricultural Prices Support Board would continue to purchase cheddar cheese produced in Ontario and Quebec on and after August 1, 1949, on a similar basis to that on which the purchase of cheese for the British Ministry of Food had been carried on up until that time, at a price ranging from 29¢ to 30¢ per pound for various grades, f o.b. factory.

Up until March 31, 1949, the operations of the Board had cost the Government of Canada approximately five million dollars including administrative expenses as compared with a total income from the 1946-48 production of all Canadian farm products of approximately six billion dollars.

Throughout its operations, the Board, as far as possible, has anticipated probable needs by studying situations that would appear likely to lead to requests for action. The staff of the Economics Division of the Department of Agriculture, assisted by personnel provided by the Board, has been requested to study production and marketing trends and to keep the price situation under constant review. When actual operations begin, the commodity divisions of the Department of Agriculture are the active agents of the Board in carrying out the purchase programs. To date the Board has not had large scale distribution and merchandising problems to handle, but with the approaching distribution problem for butter, such policies will have to be developed. As a start the Board has acquired the services of a distribution manager who in the first instance will work closely with the commodity divisions of the Department of Agriculture and other Departments of the Government as well as with the trade.

"There is pretty general agreement that the operations of the Board to date have been quite successful. Prices of commodities dealt with have been stabilized and producers have been able to market their products without the serious price declines that threatened. The stability ensured by purchase programs and guarantees has permitted the trade to purchase with confidence and there is evidence that where declining prices had already resulted in delayed purchases, products have moved freely to market once a stabilized price was obtained.

"It is understood that the Board has not encountered any serious

difficulties that may be directly attributed to its method of operation or to the Act itself. It has experienced the kind of problems that are likely to be associated with any stabilization program involving purchases of products. To what grade or class of product should support be offered in order to have the desired effect on the total volume of the product? Will a program applied to a highly specialized surplus producing area have the desired effect on prices elsewhere? Should products from areas where support is in effect be marketed in competition with those of non-support areas, and how? Should an expensive by-product processing program be undertaken in order to preserve products when there is little or no chance of recovering the financial outlay or when it is difficult, if not impossible, even to give the by-product away?"⁹

With respect to the termination of the Act, most people will agree that the idea of stipulating the transition period in the Act was to provide against the maladjustment between the primary producer and other industries which historically has occurred in the first few years following wartime inflation.

"What the Act really visualizes is the possibility of marketing difficulties and the need for adjustment in supplies of different products rather than the complete absence of markets. The Act recognizes, in short, a national obligation to use the resources of the entire country to maintain price stability for agriculture during a period when most of the economic improvement of recent years could be wiped out by causes completely beyond the control of farmers. I think we all recognize now, that even though major nations are bending their energies toward building a stable post-war economy, there is no certainty of immediate success and, therefore, each nation must guard the position of its own people, while making every possible contribution toward developing sound international relationships."¹⁰

As to the future, contracts in some form or other will likely continue to take a prominent part in any Canadian agricultural price stabilization program, even though they may or may not be carried

⁹ These quotations have been taken from an address delivered by Dr. J. F. Booth, Associate Director of Marketing Service, Dominion Department of Agriculture, on June 21, 1949, at the 1949 annual meeting of the Canadian Agricultural Economics Society.

¹⁰ This statement was made by J. G. Taggart, now Deputy Minister of Agriculture and at the time Chairman of the Agricultural Prices Support Board, at the 1946 annual meeting of the International Association of Milk Control Agencies in Montreal.

through by a system of Government boards as they have been during wartime and in the immediate post-war period. Uncertainty in the export field due to exchange problems, along with general recognition that agriculture should receive some assistance to protect it from price and marketing catastrophes, make it appear likely that the Government will extend the Agricultural Prices Support Act beyond its present expiration date.

Conclusion

There exists considerable legislation in Canada on a federal and provincial basis, which gives governmental agencies and farmers the power to take measures for controlling the marketing of farm products. These include provincial marketing and milk control legislation, the Agricultural Products Co-operative Marketing Act and the recently passed Agricultural Products Marketing Act, the latter two being described in this article. This legislation was primarily to provide for orderly marketing techniques rather than price support measures.

Canada has also, through legislation and in other ways, given other marketing aids such as those related to research, education, information, inspection, grading and many other service measures of this type designed to assist in correcting the maladjustments within agriculture and between agriculture and the rest of the economy.

Finally, Canada has passed legislation that combines marketing with provisions for minimum prices for farm products. This includes the Agricultural Prices Support Act, the Canadian Wheat Board Act and the Agricultural Products Act, the first of which has been described in some detail in this article. The overall purpose of this legislation is to reduce price instability and indirectly to have a steadying influence on farm income.

The current agricultural prices support program for all farm products is of an ad hoc nature (full consideration for each product at the time of discussion) contrasted with the use of a parity or some other formula. The price offered by the Board is not necessarily the current market price. The advantage of this procedure is that it allows for a price decision for each commodity on the basis of the current domestic and export position and gives the Board a greater scope in arriving at the immediate support price level. A disadvantage from the farmers' point of view may be that it does not in all

cases provide a forward price which might be helpful in guiding farmers in their production plans.

"Every farmer would like to have 90 percent support and no controls if he thought it could go on forever and there would never be a day of reckoning, but it won't go on and it can't go on because, by the very nature of things, high rigid agricultural prices become in themselves incentives to production. In these days when prices of agricultural products and levels of agricultural supports seem to be of overwhelming interest, we may remember that price is only one of the parts and sometimes one of the least significant parts of a real national program for the long-range welfare of the farmers of this land."¹¹

Canada is trying to meet its general agricultural marketing and price problems by means of legislation such as that described in this article, since it would appear that in the long run agriculture in Canada needs assistance in:

1. Shifting production from time to time to conform with export demand so that an adequate volume of exportable products may be maintained.
2. Maintaining production facilities for certain commodities during temporary periods of marketing difficulties.
3. Providing some program of assistance to supplement general government policy during periods of depression.

¹¹ Press statement of a talk given by United States Senator Anderson to the American Institute of Co-operation in August, 1949, as published in the American Farm Bureau Federation Official News Letter, September 5, 1949.

EXPERIENCE WITH PROVINCIAL MARKETING SCHEMES IN CANADA

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THE provincial governments of Canada have been experimenting with marketing boards and schemes to an increasing degree since British Columbia first passed "The Produce Marketing Act" in 1927. The general objective has been the supplementing of free market pricing by government sponsored boards of grower representatives under a provincial marketing commissioner. For some products the desire for higher farm incomes from "orderly marketing" within the year has been the motive. For other products, the farm groups have sought higher prices through compulsory bargaining and arbitration between representatives of the numerous farmers, and representatives of the relatively few processors or distributors who were presumed to have monopolistic powers of bargaining, and were allegedly taking abnormal profits. Through boards set up under the laws of the province with powers of compulsory arbitration, farm producers have sought to bring their own members into line, and to bargain collectively with the distributors or processors who were a bottleneck link with the consuming public. At the request of a group of producers who wish to market their products through a marketing scheme, a poll is conducted by the provincial department of agriculture. If the poll shows a majority of at least two-thirds in its favour, the scheme is proclaimed and all producers of the product concerned are thereupon compelled to comply with its terms. The chairman of the schemes has been the marketing commissioner who heads up a board of farmer members representative of the major producing areas. This board bargains with the representatives of the processors or distributors of the product, and in the case of a dispute can refer it to a governmental arbitration board which makes a decision binding to both parties. Minimum prices may be set, and the channels, quantities and qualities of marketings laid down. In many respects this procedure is peculiar to the Canadian provinces.

General History and Background

The first marketing act of the British Columbia legislature followed a four year period of low and erratic prices for tree fruits,

and declining support for the voluntary co-operative which was handling the bulk of tree fruit sales. Under the Act, minimum prices were set and the rates of marketing prescribed. Levies were imposed on the producers to cover the costs of operation of the board. This Act was ruled unconstitutional in 1931 on the ground that it sought to regulate interprovincial trade, a Federal Government responsibility. A companion act, "An Act for the Relief of Dairy Farmers, 1929," was ruled unconstitutional in 1932 because the equalization fees on the producers of milk in the Lower Fraser Valley were held to be indirect taxes, and hence beyond the taxing powers of the provincial governments. When the Federal Government passed the Natural Products Marketing Act in 1934, British Columbia immediately passed a provincial Natural Products Marketing Act in the belief that powers not resident in the Federal Government would *ipso facto* be covered by the provincial legislation. In the years 1934 and 1935, marketing boards were established in most provinces under the federal act. British Columbia and Ontario participated to a greater degree than the other provinces, and since 1935, have proceeded with provincial marketing boards with aims similar to those embodied in the federal legislation. Nova Scotia has put into effect schemes covering apples and wool under an act of 1946. Alberta has an act of regulatory features covering poultry marketing. Saskatchewan possesses similar legislation but it has not been put into effect. This brief survey of the background of the marketing boards indicates their gradual development in the Canadian provinces.

In many respects the agricultural commodity groups participating in marketing boards resemble the organized labour unions in their regional collective bargaining. Whereas labour unions must expand their membership by persuasion, the operation of schemes is commenced by a two-thirds vote of approval by the farmers, most of whom may be largely passive to the objectives of their leaders.¹ The compulsory fees on each unit of product sold by the farmers compare with the compulsory check-off of the unions, while the compulsory arbitration by government represents more than the mediation services provided by the Departments of Labour. The processors under the marketing boards can decide how much of

¹ This is the administrative policy, rather than the legal requirement. *Vide* speech of Mr G. F. Perkins, Chairman, Farm Products Marketing Board of Ontario, March 14, 1949. No legal requirement is stated in the British Columbia Act.

the product they will buy, just as the employers of labour agree to the wage rates and other conditions, and then hire the number of labourers which they regard as most profitable to their business. The similarities to labour unions are very pronounced.

The Dominion Natural Products Marketing Act

During the fifteen years preceding the Natural Products Marketing Act of 1934, farm prices and incomes had fallen severely in a nation heavily dependent on the exports of primary products. Not only had farm incomes declined from 1920 to 1922, but the recovery in raw materials prices to 1929 had been modest. The depression began in 1929 and from then until 1933 intensified. Farmers looked for some means or other of resisting the fall in their incomes and turned to marketing adjustments, as United States had done under the Federal Farm Board in 1929 to 1931, and as British Columbia had attempted to do in 1927 to 1932. During the 1920's, and especially from 1927 to 1929, Canada had undergone a burst of consolidation in its food products industries. Canadian Canners had absorbed many small canning companies; Canada Packers was formed as a holding company in 1927; Western Canada feared the Nash combination which was dominant in the sale of fresh fruits and vegetables in the four western provinces. In part these consolidations represented larger firms absorbing the smaller ones which had excess capacity, but farmers were suspicious of the reduced number of buyers for their products. British Columbia had already experimented with marketing controls which established bilateral bargaining of the farmers' selling monopoly and the processors' or distributors' group. The Royal Commission on Mass Buying and Price Spreads in its hearings in 1934 had publicized certain aspects of large-scale buying which convinced farmers that the incidence of the depression was falling with undue severity on the prices of their raw products. For reasons such as these, Canadian agriculture supported the passage of the Natural Products Marketing Act by the government of Canada in 1934. This legislation applied to interprovincial and export trade. On the whole the farm groups which took advantage of the Act were already organized, the least depressed, and in small contiguous areas. British Columbia raw material producers took greatest advantage of the Act. The following schemes serve as illustrations: British Columbia Tree Fruit, British Columbia Red Cedar Shingle, British Columbia Dry Salt

Herring and Dry Salt Salmon, Milk Marketing of the Lower Mainland of British Columbia, British Columbia (Interior) Vegetable Marketing, British Columbia Coast Vegetable Marketing, British Columbia Halibut Marketing, British Columbia Hot-house Tomato and Cucumber Marketing, British Columbia Small Fruits and Rhubarb Marketing and the British Columbia Sheep Breeders' Marketing Scheme.² Ontario producer groups covered by the Natural Products Marketing Act included Ontario Flue-Cured Tobacco, Western Ontario Beans, Ontario Cheese Patrons and Ontario Burley Tobacco. Certain schemes cut across provinces such as the Fruit Export Marketing, Eastern Canada Potato Marketing, Canada Jam Marketing, Processed Berry Marketing, Dairy Products Marketing Equalization, and the Butter Export Stabilization schemes. The only purely Maritime Scheme was the Grand Manan Smoked Herring Products of New Brunswick. The export schemes (dairy products and butter) attained very little experience.

The boards administering the schemes were allowed to advise on tariff policy. They had powers to regulate marketing, to establish pools, and to levy license and equalization fees on processors and farm producers. It will be observed that the schemes were heavily weighted by British Columbia products which were produced in clearly defined, semi-isolated agricultural districts, where bottlenecks existed in processing or packing establishments, or in transportation outlets. The Ontario and Grand Manan schemes also applied to clearly defined areas in the case of beans, burley tobacco, flue-cured tobacco, and smoked herrings.

As an illustration of the setting of the time of marketing, the British Columbia Tree Fruit Scheme authorized the monthly release of apples. The places of marketing were prescribed in the Ontario Cheese Patrons Marketing Scheme. All cheese was to be sold at auction on local cheese boards in order to ensure a greater degree of competition between the buyers of the product. The quantity of product marketed was prescribed under the British Columbia Salt Fish and Red Shingles Marketing Schemes. Minimum grades were set under the British Columbia Tree Fruits and Eastern Canada Potato Marketing Schemes. The method of distribution was determined in part by the Eastern Canada Potato

² *Vide* F. M. Clement, *et al*, "The Regulation and Control of Marketing," pp. 217-231, *The Economic Organisation of Canadian Agriculture*.

Marketing Scheme where sales on consignment by dealers were forbidden. Tolls on sales were generally collected when the product was received by the distributors or processors. Regional representative boards operated within the limits prescribed by the Dominion Marketing Board.

The legality of the Natural Products Marketing Act under the British North America Act of 1867³ was referred to the Supreme Court of Canada in November, 1935. After that date no further boards or schemes were established, and in effect the Act came to an end. In June 1936 the Supreme Court of Canada ruled that the Act was unconstitutional (*ultra vires* of the Federal Government). In January 1937 the Legal Committee of the Privy Council in the United Kingdom, the highest legal authority on constitutional matters, upheld the Supreme Court of Canada's decision, and as a result the boards established under the Natural Products Marketing Act were disbanded.

The Provincial Boards and Schemes

British Columbia's Natural Products Marketing Act of 1934 continued in force, and in a reference to the Supreme Court of Canada in November 1938 was held to be within the powers of the provincial government. Certain schemes have been continued in British Columbia under this act, notably the British Columbia Tree Fruit Marketing Scheme, the British Columbia Coast Vegetable Scheme, and the British Columbia Interior Vegetable Scheme. In Ontario the Farm Products Control Act was passed in March 1937 to allow marketing schemes to continue under provincial authority in that province. Almost immediately the Ontario Cheese Producers' Marketing Scheme was put into effect. Shortly afterwards the asparagus, pear, plum, cherry, and peach growers came under schemes for that part of their crops which went into processing. Significantly the Ontario Flue-Cured Tobacco Growers and the Ontario Burley Tobacco Growers did not set up schemes under the new provincial legislation. Instead they incorporated themselves under the Ontario Companies Act, and have handled their own price negotiations, acreage allocations, and marketings of tobacco ever since.

³ The British North America Act of 1867 incorporated Canada as a federal union. The powers of the provinces were listed, with remaining powers to the federal government. Judicial decisions have further defined the powers, and established precedents.

The Ontario products now covered by marketing schemes include the following annual crops: tomatoes, peas, green and wax beans, sweet corn, beets, carrots and cabbage for processing, dry field beans, seed corn, soya beans, new potatoes and sugar beets. Raspberries and strawberries for processing are representative of short run crops. Asparagus, peaches, pears, cherries, plums and grapes for processing represent perennial crops. The other products covered are cheese, hogs and cream. The dates of introduction of the schemes indicate that since 1944 the boards have expanded considerably. The schemes in force in mid-1949 are:

- The Ontario Cheese Producers' Marketing Scheme, 1938
- The Ontario Asparagus Growers' Marketing Scheme, 1938
- The Ontario Pear, Plum, and Cherry Growers' Marketing Scheme, 1938
- The Ontario Peach Growers' Marketing Scheme, 1938
- The Ontario Sugar Beet Growers' Marketing Scheme, 1942
- The Ontario Seed Corn Growers' Marketing Scheme, 1944
- The Ontario Berry Growers' Marketing Scheme, 1944
- The Ontario Bean Growers' Marketing Scheme, 1944
- The Ontario Vegetable Growers' Marketing Scheme, 1946
- The Ontario Hog Producers' Marketing Scheme, 1946
- The Ontario Cream Producers' Marketing Scheme, 1947
- The Ontario Grape Growers' Marketing Scheme, 1947
- The South-Western Ontario New-Potato-Growers' Marketing Scheme, 1948
- The Ontario Soya Bean Growers' Marketing Scheme, 1949

As previously indicated, provincial marketing acts have been passed in Alberta, Saskatchewan, Nova Scotia and New Brunswick. Alberta has instituted a poultry marketing board, but its powers have been purely regulatory with a view to improving the quality of poultry and eggs. New Brunswick's Act has not extended beyond the continuation of the Grand Manan Smoked Herring Products scheme. The degree of use of marketing legislation varies considerably within Canada.

General Powers of the Boards

Under the marketing boards, as presently constituted, the usual procedure is to set up provincial boards and to establish districts with representatives from each district on the provincial board. The provincial boards can establish local boards which serve in an advisory role. The boards have power to investigate, arbitrate, adjudicate upon, adjust or otherwise settle any dispute between pro-

ducers, processors, distributors or transporters of farm products, or between any two such classes of persons. They may investigate the cost of producing, processing, distributing and transporting any farm product, prices, price-spreads, trade practices, methods of financing, management, grading, policies and other matters relating to the marketing of farm products. They may do such acts and make such orders and directions as are necessary to enforce the observance and carrying out of the provisions of the Act, the regulations, and any scheme. They may establish price negotiating agencies for any scheme and adopt or determine fair or minimum prices for any regulated product, or any grade of a registered product. They may exempt from any scheme or any order or direction of the Board, any person or class of persons engaged in the producing or marketing of any regulated product or any class, variety or grade of regulated product. They may require persons engaged in the producing or marketing of a regulated product to register their names, addresses and occupations with the Board; require such persons to furnish such information in regard to the regulated product as the Board may determine, and inspect the books and premises of such persons. They may require the furnishing of security or proof of financial responsibility by any person engaged in marketing a regulated product. They may refuse to grant any license for any reason which the Board may deem sufficient. Persons may be prohibited from engaging in the marketing or processing of any farm product except under the authority of a license issued by the Board. The Board may suspend, revoke or refuse to renew any license for failure to observe, perform, or carry out any of the provisions of the Act, and the regulations of any scheme, or any order or direction of the Board. In every case the applicant shall be afforded an opportunity of appearing before the Board to show cause why such license should not be suspended or revoked or why such renewal should not be refused. The Board may, by such means as it may deem proper, stimulate, increase or improve the marketing of farm products. The commodity boards may require the licensing of persons engaged in marketing or processing, and may prescribe the license and equalization fees. They have the power to collect, use and return service charges or equalization fees on farm products. Under the British Columbia Act, loans may be granted to assist the construction of storage facilities. A feature of the British Columbia boards is their emphasis upon having all sales go across one desk to the distribu-

tors, together with a pooling of sales throughout the season. These powers are substantially similar in all provincial acts, but the extent of use varies greatly between provinces.

In practice the license fees on processors or distributors have been purely nominal. The administrators have been guided by the experience of the Act for the Relief of Dairy Farmers (British Columbia) where the license fees were held to constitute indirect taxation and to be *ultra vires* of provincial authority. Moreover, the Agricultural Adjustments Act of the United States had been thrown out in 1936 on the issue of processing taxes. By negligible processors' fees, the provincial Marketing Acts in Canada are not liable to such a judicial reverse. The fees collected under provincial acts have come from farm producers, although they are deducted by the processors. The following fees collected in Ontario in 1948 or in the 1949 schemes authorized to date may serve as illustrations:

cheese—5 cents per hundredweight of cheese
hogs—2 cents a carcass
peaches for processing—40 cents a ton
cream—1/10 of a cent per pound of butterfat
sugar beets—3 cents per ton delivered to processor
South-Western Ontario new potatoes—1 cent per 75 pound bag
berries for processing—1/10 of a cent per quart
beans—2 cents per bushel license fee
38 cents per bushel equalization fee
asparagus for processing— $\frac{1}{2}$ cent per pound
seed corn—2 cents per bushel
soya beans— $\frac{1}{2}$ cent per bushel.

General Appraisal of the Schemes: Their Value and Significance

Since the marketing boards and schemes are in force in several of the Canadian provinces, and are supported to some extent by the three major political parties of Canada, it is appropriate to examine their objectives and their administration. Already Ontario and British Columbia have had over a decade of experience. Ontario will be used as the main illustration.

1. Many schemes were launched out of the conviction that price gains could be secured if some intermediate bargaining agency could be set up between the numerous farm producers and the few buyers or processors. Especially if there was one dominant buyer, the small sellers and their local agents could, through organization, avoid taking a low price or a narrow margin for their produce.

For the monopoly buyer, there is undoubtedly an upper limit to the price that he will pay, and a lower price at which farm producers may be induced to sell. The margin which is the monopoly gain to the buyer is something that the sellers may be able to extract under pressure. The sellers may also feel that their centralized board can carry price determination out from the consuming or processing centres to the production areas. Perhaps some gains in price have been attained for producers by their consolidation under a marketing board. They might equally well be attained through a selling co-operative. Certainly our city labourers have felt impelled to form their trade unions for similar reasons so that the buyer of labour service might be faced by one selling agency rather than hundreds or thousands of freely competing labourers. On the other hand it may be impossible for a central selling agency to attain any gains through such bargaining. If there are a few large buyers of farm produce, each one anxious to maintain his share of the market, and each determined not to let the others get a price advantage (and a profit opportunity) by buying cheaply in one or more local markets, then the market prices will approximate the competitive level. Surely this situation is fairly typical, and since it is general, the gains from bilateral bargaining are probably very slight in many cases, and the cost of operating the boards may be a clear deduction from the income that farmers would receive, especially during sellers' markets and rising prices, as in the period since 1941.⁴

2. Frequently the argument is raised that the marketing schemes are the essence of democracy as the individual farmers can vote a scheme into effect, or can vote its termination. In fact most Ontario schemes have been inaugurated by wide majorities. It should be remembered, however, that a majority of a commodity group is almost inevitably a minority of all farmers and inevitably a minority of the total population. There is no guarantee that producers are acting in the public interest, or in the consumer interest through the price policy of the schemes. The most that can be said is that democracy exists within the group itself. Moreover, the marketing acts do not contain specific provisions for the re-polling of producers to ascertain if the schemes have a continuous broad base of support. This would seem to be a large oversight.

⁴ *Vide* W. Baum, *Pricing in the Tobacco Auction*, Proceedings of the Annual Meeting of the New England Research Council on Marketing and Food Supply, April 14-15, 1949.

3. To some extent the operation of marketing schemes in Ontario has encouraged cost studies of labour, equipment and material inputs into crop production. Certainly cost and farm management studies were conducted previously, notably in fluid milk production, but to assist in price negotiations producer groups have asked for and received assistance in cost studies of canning corn, peas and tomatoes. To some extent the changes in costs are considered when bargaining for contract prices, while the farmer's cost position has encouraged him to examine his production practices. This has contributed to improvements in farm management, and as such is highly welcome.

4. A third aspect of the marketing schemes has been the extent to which the contract prices have served as forward prices. For certain of the schemes, notably cheese, cream and hogs, no effort has been made to implement forward prices. For annual crops such as sweet corn, peas, beans, and tomatoes, the floor prices are generally determined between January and the middle of March, in time to influence plantings. In 1949, however, disputes over prices and related conditions led to deadlocks between producers and processors, and the price which came out of the arbitration proceedings left little time for adjusting farm plans. The floor prices for the season have provided a measure of price assurance to farmers, and the opportunity to balance the income alternatives of one crop against another. For tree fruits such as cherries, plums and peaches, the price negotiations await knowledge of crop conditions. For Ontario new potatoes, and British Columbia fresh vegetables, returns are calculated on the basis of the receipts from pooled sales. In such cases, the prices represent bargaining alone, with no opportunity to alter annual production. On the criterion of forward pricing, the marketing boards have had a somewhat irregular record.

5. The required conditions for the institution of a marketing scheme in Ontario suggest limitations to their application and usefulness. In the Report of the Minister of Agriculture (Ontario) for 1944 three considerations were mentioned in the establishment of a scheme. First, each proposed scheme had to set out a practical marketing problem. Second, the marketing of the crop had to be subject to effective regulation under the limitations of provincial jurisdiction. Third, if the first two conditions were met, a ballot of the growers was to be conducted to determine whether the majority were in favour of the scheme. In practice these conditions have meant that the schemes have generally begun with well de-

financed areas of production, with products sold primarily on the domestic market, with few processors or buyers, and with considerable ease of administration. These conditions are met by the British Columbia and all existing Ontario schemes, except those concerned with cheese, hogs and cream. The cheese and hog schemes deal with produce a large part of which is exported. The cream scheme involves many scattered producers, but with consumption entirely in Canada. The ease of administration, the requirements of contiguous producers, and few bottlenecks easily subject to control, suggest that producers in regions of scattered production feel they cannot acquire significant price and bargaining advantages through the existing marketing schemes. As illustration of this point certain marketing schemes have been abandoned. The Holland Marsh Growers' Marketing Board was abandoned after one season, 1937. Growers lost confidence in one centralized agency for the sale of lettuce. They were of diverse national origins, and slow to co-operate among themselves. Their major market was in nearby Toronto while their product had its peak demand at the time of its greatest perishability. For similar reasons a proposed South Essex Growers' Scheme considered in 1937 was not put into effect. The Erie-St. Clair Onion Growers' Marketing Board was withdrawn after the one season's experience in 1939, when farmers indicated their preference for the former marketing channels.

6. At this point it might be appropriate to discuss loopholes in the marketing schemes, and their bearing on the longer-run success of this form of price bargaining. With rare exceptions the schemes prescribe only the floor prices that must be paid for the product. The quantity to be purchased by the processor is not laid down, with the exception of canning tomatoes in the 1949 Ontario crop. If equilibrium price is defined as that which equalizes the quantity purchased by the buyers and the quantity that suppliers are willing to produce, then a low negotiated price becomes ineffective since buyers will bid up the price above this level. This often happened in the canning crop contracts during the war and early post-war years. On the other hand if the negotiated price is above the equilibrium price for the quantity produced, processors or buyers will limit their purchases to the quantities that they can handle with greatest profit. If the product is semi-perishable the balance must be disposed of on the fresh market for what it will bring. In the case of peaches, the fresh market has been considered the higher priced market. If peaches are not absorbed by the processors they

must be pushed on the fresh market or go to waste. In the case of asparagus the fresh market is considered the premium one, and asparagus is diverted to the processed market largely to ease the pressure on the price of fresh asparagus. For several years, the license fee collected from growers was used to subsidize the export of canned asparagus. While it is probable that mistaken price policies of those in charge of the schemes have forced some wastage of the fresh product, physical wastage may also occur from production in excess of the capacity of the processing plants. It is not always immediately clear how much wastage price policies have caused. Physical wastage of products covered by marketing schemes needs to be examined from both short-run and longer-run effects on producers' incomes and on inter-product competition. Higher producer incomes in the short-run may be obtained by some deliberate physical waste. Over the longer period other producers will expand their output to take advantage of this higher price. Meanwhile consumers will shift their purchases to other items which have not increased in price. Such producer gains, therefore, soon become dissipated.

7. If the negotiated prices have been raised above the competitive equilibrium level, the growers will find comparative advantages of crops with high fixed prices higher than other crops with lower fixed prices or completely free prices. Production of the high priced crop will increase, and the purchases by dealers will leave some of the crop unsold. In periods of sellers' markets the processors will try to pass on their higher costs of materials to consumers through higher retail prices. In periods of declining prices and buyers' markets, high fixed prices will reflect back to farmers in reduced purchases by the processors. Meanwhile consumers will shift their purchases to those items the prices of which have not risen or have fallen the most. For products which touch a high-income market or possess an inelastic demand, growers and processors have a short-run price-raising advantage which they may exploit. This has probably been the situation in the case of canned asparagus where surplus packs, which would depress Canadian prices, have been exported to the larger United States market. For products with greater price elasticities of demand, price increases quickly reflect to processors in lighter sales and to growers in lighter purchases by processors or dealers.

8. The schemes lack formal controls over each province's production. Price policy may encourage expanded production through

more acres, higher yields per acre or animal, or new producers not covered by the schemes. The situation report of the Dominion Department of Agriculture for 1948 indicated that more of the Canadian pack of canned vegetables is being grown in provinces not covered by marketing schemes. Quebec, the Maritime Provinces, Manitoba and Alberta had a larger portion of the pack of green and wax beans, canning corn, canning peas and tomatoes in 1948 than in 1943 to 1945. The increase in beans and tomatoes was particularly notable in Quebec, while Alberta showed more beans and canning corn. Ontario and British Columbia, which operated under marketing boards, were not retaining their proportion of the total Canadian pack of canning vegetables although this has been clouded by the general expansion in the canning of vegetables.

9. From the standpoint of the general public, another significant loophole has been the absence of interprovincial agreements between marketing boards concerning the prices of farm products. Where a product sold on a nationwide basis originates chiefly in one province the existing price is affected by the production of other areas. As an illustration of price-leadership arising from the price negotiation of a marketing board, the British Columbia Interior Vegetable Marketing Board is reported to have deferred the announcement of its prices for canning vegetables in 1949 until after the Ontario prices had been announced.⁵ This could permit British Columbia prices to be set to allow for interprovincial competition by its canned produce.

The interprovincial undercutting of prices may be eliminated or at least reduced in future by the collaboration of the major producing areas through interprovincial agreements under the federal Agricultural Products Marketing Act of 1949. On the other side of the picture the difficulties in the way of achieving this objective are likely to increase, especially in canned fruits. The rapid increase of British Columbia's pack of pears, plums, peaches, cherries and raspberries since 1935-39 means that products priced under the Natural Products Marketing Act (British Columbia) will soon compete severely with products priced under the Farm Products Marketing Act of Ontario (1946). The poultry groups have already given some consideration to having the marketing of poultry products brought under a national marketing agreement of some kind under the new federal legislation. To the extent that the major

⁵ Current Review of Agricultural Conditions in Canada, April, 1949, p. 14.

producing areas of the several provinces are able to effect joint arrangements price competition will be reduced.

10. All of the marketing acts mention as one of their objectives the improvement of marketing methods. This improvement is presumably additional to that already provided for by government agencies and the trading groups themselves. If improvements are introduced which influence quality, transportation or selling methods, they must arise from the study and appraisal of marketing alternatives. This implies that research in commodity marketing will be more lavishly endowed and more incisively analysed by the groups participating in schemes. Since the boards are staffed by grower representatives, this type of research into improved methods is likely to be conducted by part-time investigators following up hunches and the simpler forms of induction. The question may well be raised of the value of this research by self-interested commodity groups, in comparison with the results that might be secured by the established research agencies of government which would be free of commodity bias and special pleading. If, however, the boards make use of these existing research bodies, some very valuable results may be obtained.

11. Some of the Ontario annual contracts such as those for sugar beets and seed corn confine their content to the prices of clearly defined grades, terms of payment, and by-product allowances or adjustments. This may be compared to the short statement of principles contained in the collective bargaining agreements of well established labour unions and their employers. In other contracts such as the 1949 Ontario tomatoes for processing contract, the conditions of sale, grading, deliveries, payments, etc., are outlined in great detail. When such details must be arrived at by arbitration rather than peaceful negotiation there is clear indication that the working relationships of growers and processors are not characterized by mutual confidence and satisfaction. When the parties to the contract operate under such detailed regulations as exist in the tomato agreement, other differences almost inevitably will assert themselves and may be encouraged by resentment and hostility to the arbitration procedure. In other words, if goodwill does not already exist between growers and processors, it is much less likely to exist if detailed conditions are inserted in marketing contracts.

These considerations raise the question as to whether marketing boards have, generally, contributed to better producer-processor understanding. If each party to the negotiation must respect the

strength of the other, then their joint interest in productive efficiency, quality maintenance, and volume of sales may contribute to cost-reductions, pooling of knowledge, and the ascendancy of mutual interests over mutual conflicts. The financial success or difficulties of the processors is not a matter of indifference to the long-run interest of growers, while it is to the interest of processors to have their patrons near to their plants. In many cases the schemes, by enforcing collective as contrasted with individual bargaining, have contributed to goodwill which may ensure the continued existence of voluntary bargaining associations of producers should the schemes themselves be withdrawn.

12. Some commodity groups have, without doubt, asked themselves whether any significant results have been attained from the operation of marketing schemes. All Ontario schemes have the power to assess levies against farmers. Usually the levies are not large, and it is frequently pleaded that they are justified because of their modest size.⁶ Quite independently of the size of the levy it may be asked whether the course of development of the Ontario hog scheme (in effect since 1946), and the Ontario cream scheme of 1947 are likely to bring results which would justify their existence, and their financial support. In other words might not as significant marketing improvements have come from governmental agencies? To plead that the industry is complicated by export and interprovincial trade, by joint or by-product production on farms, and by competing demands of processors and consumers (e.g. milk, poultry and meat products), is to admit that the schemes are attempting to accomplish results that they should never have undertaken. The farmer may well ask whether well-considered economic research and food products regulation might not have given him just as good, if not better, results for each dollar taken from his gross income in taxes and levies.

13. The consensus of farm opinion seems presently to be in favour of marketing legislation.⁷ All provinces except Manitoba, Quebec and Prince Edward Island possess marketing legislation, while the Federal government has passed an enabling act allow-

⁶ The equalization fee of 38 cents a bushel on Ontario (field) beans, however, seems unduly large even to cover the price risk of the export market.

⁷ An exception which may reflect changing farmer opinion is the rejection of a proposed poultry products board of the Lower Mainland of British Columbia in a vote of July, 1949. In this case the bulk of sales was handled by a producer co-operative whose policy presumably was considered sufficiently attractive by farmers of the lower Fraser Valley.

ing interprovincial schemes.⁸ As has been mentioned, the provincial marketing boards are likely to find increased competition within Canada, particularly in canned fruits. An important question is whether marketing boards as presently constituted could provide for the reconsideration of contract prices, quantities and grade differentials if business conditions were to change suddenly and unexpectedly. The operation of the pools in British Columbia suggests that their act might be administered to deal with an emergency decline in consumers' purchasing power. Ontario's Act gives no indication of this flexibility and some commodity representatives insist that the success or failure of the processors is their own risk. Recognition of a greater common bond of interest is needed as well as provision for price-flexibility in case of emergency.

14. The question may be raised as to whether the stated objective of expanding domestic consumption and exports might not be brought about just as well by a programme of quality improvement with premiums and discounts for grades administered by the Departments of Agriculture as by any program that might be undertaken by marketing boards. Another important consideration is whether farmer co-operatives have been strengthened or weakened by price-bargaining under marketing schemes. Co-operative experience has shown that a fairly strict adherence to the Rochdale principles, and the confidence and criticisms arising from the individual members are essential to the long-run success of co-operatives.⁹ Unless co-operatives are constantly alert to member relationships and business developments, their support weakens. This is particularly a danger when difficulties in price and contract negotiations can be thrust on the governmental arbitrator. After all, governmental support cannot be presumed permanent. Co-operatives may have the strength to carry on without governmental price arbitration, as the Ontario tobacco groups have done since 1937, but they must be kept constantly alert. The question may be raised of how many farmer producer groups have the strength to stand on their own, and bargain with the processors and distributors if the government's support given to marketing boards was suddenly withdrawn. That would be the test of the strength of farmers' co-operative bargaining.

⁸ *Vide* article by A. H. Turner in this series. The agriculture of the new province of Newfoundland has been omitted as negligible.

⁹ This paper has assumed that "compulsory co-operation" is a misnomer in comparison with voluntary co-operation.

With the prospect of lower incomes for Canadian agriculture, policy decisions on marketing boards and schemes cannot be long delayed. One decision might be to reduce the scope of schemes to quality regulation which has been a traditional role of governments, with provision for price arbitration in case of serious breakdowns of negotiations between producer groups and produce buyers. The Alberta, Saskatchewan, New Brunswick and Nova Scotia Acts aim at approximately that objective, as does the revised Milk Control Act of Ontario (1948). Another decision might favor compulsory prorating of acreages or of marketings such as exists in the California Pro-Rate Act or the British Columbia Fruit Board. Both of these areas are geographically clearly defined, and therefore possess ease of administration. Still another policy might provide for governmental subsidies to support negotiated prices and volume of production or sales in case world prices should decline, as has been done in the United Kingdom since the war. Its feasibility would depend on the financial strength of the government, the degree of self-sufficiency of the nation in respect to food, and the magnitude of price declines. It might not be feasible in the Canadian provinces where food price declines would probably be a part of the general decline in all prices.

In conclusion, the experiences of the Canadian provinces with marketing boards have brought social innovations into marketing in the belief that marketing boards with farmer representatives, supported by the compulsory arbitration of governments, could attain increases in farm income through collective bargaining with distributors and processors. The gains in marketing efficiency have not been great, even in "orderly" marketings which have been the goal of British Columbia's boards, for it is not self-evident that governmentally supported boards are doing better than might be expected from voluntary co-operatives with good business leadership and storage facilities. Weaknesses and dangers exist in farmer attitudes toward the boards as a form of income security. Certain of the features, notably the pooling of knowledge of production and trade practices, and forward pricing have contributed to better understanding and improvements in quality, but these have been by-products of hard-headed bargainings over price. The provincial boards, especially in Ontario and British Columbia, must give greater consideration to the long-run consequences of their policies if they are to serve wisely the farmers and the general public.

DEVELOPMENT OF WHEAT MARKETING POLICY IN CANADA

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PRODUCTION and marketing of wheat have been among the most important economic activities in the Dominion of Canada for the past half century. The Canadian wheat economy was created largely after 1900 in the Prairie Provinces, in the northern extension of the continental hard spring-wheat region. The settlement of this area provided tremendous population expansion and investment opportunities throughout the entire Dominion. Within a generation after 1900 the Canadian population doubled, reaching a total of 10.4 million people by 1931. Over the same period the population of the Prairie Provinces increased five-fold to a total of 2.4 million people. In 1900 less than one-twelfth of the Canadian population lived in the Prairie Provinces; by 1931 approximately one-quarter lived there.

Prairie lands "ready for the plough" were brought under cultivation by millions of acres. Ten million acres were in wheat by 1911, twenty-two million by 1921 and twenty-five million by 1931. Wheat crops which in the early years of the century were measurable in tens of millions of bushels increased to hundreds of millions of bushels. The average Canadian wheat crop (approximately 95 percent of which is grown in the Prairie Provinces) for the ten year period, 1929-38, was 309 million bushels. The average crop for the six war years, 1939 to 1945, was 439 million bushels. Four times Canada has harvested over half a billion bushels of wheat in a single year—in 1928, 1939, 1940 and 1942.

From a position of minor importance among Canadian exports in 1900, wheat and wheat flour advanced to first place by 1920. In the late 1920's wheat and flour yielded one-third of the dollar value of Canadian exports. Over the ten years 1929 to 1938 annual wheat exports averaged 200 million bushels. Throughout the second World War the average was 259 million bushels. Though Canadian farmers produce less than 10 percent of the world wheat supply, their exports—approximately two-thirds of their production—accounted for from 35 to 40 percent of the world trade in wheat in the late inter-war years.

These facts suggest the importance of wheat to the Canadian

economy. They suggest also that Canadian wheat marketing policy has always been essentially wheat export policy and, as such, has been the responsibility of the Dominion Government. It is important for the present analysis, therefore, to review the position of the Government in regard to the marketing of Canadian wheat.

Until very recent years Canadian governments at the federal level have held to the view that wheat should be marketed by the private trade and under the "open market" system, with government intervention limited to licensing and supervision. This view was maintained in spite of persistent advocacy of grain growers that it be abandoned in favor of state trading, and in spite of exigencies to be noted later which forced its temporary modification. Though it involves pre-judgment of the future to say so, it is argued in the present analysis that the action of the Dominion Government in creating a national monopoly of wheat marketing under the Canadian Wheat Board in 1943 marks a fundamental change in government attitude toward wheat marketing policy rather than merely another temporary modification dictated by abnormal expediency.

Under the open market system Canadian wheat was handled by specialized agencies, by elevator companies—whether "private" or co-operative—by commission agents, merchants and exporters. The central institution within this system, both functionally and symbolically, was the Winnipeg Grain Exchange. Until 1943 the futures market in the Winnipeg Grain Exchange was one of the great futures markets of the world. To the supporters of the open market system it stood as the symbol of all the virtues of free enterprise. To the grower it epitomized the hazards to which a freely moving price system may condemn a group of highly competitive producers in the marketing of their product.

The Dominion Government was first driven into active intervention in the Canadian wheat trade by the extremities of Allied food supply during the first World War. Faced by the gravest possible food crisis in 1916 the Allies established centralized buying of wheat in North American markets. By the early spring months of 1917 the Grain Export Company—the North American purchasing agency for the Allies—had secured a corner on Winnipeg May wheat. The fact that this corner developed in the course of *bona fide* efforts by the Allies to assure themselves of adequate supplies of wheat rather than for speculative purposes in no way modified

the trading panic which arose in the Winnipeg and Chicago markets when the shorts discovered their position and began to "run for cover." Futures trading was necessarily suspended temporarily and short positions were settled by agreement. In June, 1917, the Dominion Government established the Board of Grain Supervisors by Order in Council and endowed it with full power to fix the price of Canadian wheat and to determine its movement from the local elevator to the Allied purchasing agency. The urgency of the circumstances which called the Board into existence outlasted the war and the Board set the price for, and directed the movement of the crops of 1917 and 1918 as well as the balance of the 1916 crop. Prices set by the Board were \$2.40, basis No. 1 Northern Fort William,¹ for the balance of the 1916 crop, \$2.21 for the 1917 crop and \$2.24½ for the 1918 crop. Futures trading on the Winnipeg market was suspended on September 1, 1917, and remained suspended throughout the period of the Board's activities.

Persisting in the view that only the utmost abnormality in trading conditions could justify state intervention in the movement and pricing of Canadian wheat, the Dominion Government allowed the activities of the Board of Grain Supervisors to come to an end in 1919, with the intention, apparently, of permitting the private grain trade to function as it had before the war. Futures trading was re-established in Winnipeg for a few days in the latter part of July, 1919. It was quickly demonstrated, however, that conditions were far from normal by any pre-war test. Following consultation with representatives of the Canadian Council of Agriculture the Government established the first Canadian Wheat Board to handle the entire 1919 crop on a state monopoly basis.

The Wheat Board of 1919-1920 was modelled on Australian experience and differed in important respects from its Canadian predecessor, the Board of Grain Supervisors. Whereas the latter had established fixed prices and had directed the movement of Canadian wheat, the Wheat Board took title to all wheat marketed in Canada, paid the grower a fixed initial payment and issued participation certificates for whatever additional sums might be realized from the sale of the wheat. The wheat was then sold by the

¹ All wheat prices quoted in this article are on the basis of No. 1 Northern in store at Fort William-Port Arthur unless otherwise indicated. The Fort William-Port Arthur price includes certain fixed charges of approximately 20 cents a bushel for freight, elevator handling charges, inspection and grading fees, commissions, etc.

Board throughout the year at prices which were negotiated specifically for specific consignments. The total proceeds from sales less the initial payment were finally paid on a pro rata basis to the holders of participation certificates. The 1919 crop was marketed, in effect, on the basis of a state-operated compulsory pool. The initial payment was set at \$2.15 per bushel and additional payments brought the total proceeds to \$2.63 per bushel. In July, 1920, the Government, expressing its belief that the unusual circumstances which had justified the establishment of the Board no longer existed, stated that the Wheat Board would not function for the 1920 crop and that wheat marketing would revert to the "normal" methods of pre-war years.

Three years of complete control of Canadian wheat marketing by the Dominion Government had done nothing to alter the official viewpoint that grain should normally be marketed by means of the open market system. With the growers, however, it was a different matter. The possibility and comparative efficacy of a new system of marketing had, as far as they were concerned, been amply demonstrated. In the months which followed the restoration of open market trading in 1920 the price of wheat fell drastically. It was easy to argue that the Board, had it been continued, might have prevented or at least significantly tempered the decline. The growers accordingly were determined not to remain longer at the mercy of the open market system. From 1920 to 1923 they fought persistently to have the Wheat Board re-established. They abandoned the fight eventually only when repeated governmental rebuffs had finally convinced them that the fight was hopeless and when at the same time they came to believe that an alternative solution lay within their own power to put into effect. This alternative was that wheat might be marketed by cooperatively organized producers' pools without reliance on the futures market.

The wheat pool period is of considerable importance in the history of Canadian wheat marketing. Within the limits of the present analysis, however, this period can only be briefly commented on to indicate its significance for the development of Canadian wheat marketing policy. The provincial pools and the Central Selling Agency which were established in 1923 and 1924 were modelled on the non-stock, non-profit, voluntary contract type of commodity pools which had become prevalent in California in the war and early post-war years. The inspirational oratory of a colorful Cali-

fornia attorney, Aaron Sapiro, brought to western Canadian farmers the vision of a new economic gospel. The expansion and early successes of the Canadian wheat pools were little short of spectacular. Over the years from 1924 to 1931 the pools handled approximately one-half of the wheat marketed in western Canada.

In terms of wheat marketing policy the wheat pool period is of significance for two reasons in particular. In the first place, a good deal of evidence accumulated during the late nineteen-twenties to indicate that many wheat producers regarded the voluntary pools as but an imperfect substitute for a single compulsory pool sanctioned by legislation or, better still, operated by the Government as in 1919-1920. In the second place, the financial difficulties in which the pools became involved due to the collapse of prices after 1929 forced the Dominion government for a second time into a measure of market intervention far beyond anything regarded as normal in the field of Canadian grain marketing policy.

The financial difficulties of the wheat pools arose out of their system of financing in conjunction with a drastic decline in prices. For the 1929 crop the pools made an initial payment of \$1.00 per bushel, the funds being advanced by the banks on the security of warehouse receipts. In January, 1930, No. 1 Northern wheat at Fort William was priced at approximately \$1.40 per bushel. By a persistent decline throughout the ensuing months wheat was worth just over 50 cents per bushel by the end of the year. With the value of the bank-held collateral impaired, the pools in February, 1930, secured the guarantees of their respective provincial governments, and in November the guarantee of the Federal Government. The Federal guarantee was conditional upon the appointment of a government nominee as general manager of the Central Selling Agency. With the appointment of John I. McFarland to this position the Central Selling Agency became in effect a public rather than a producer-controlled marketing agency. Its primary purpose was to save the Canadian grain trade from total collapse and in this way to support the Canadian banking, business and agricultural community.

Mr. McFarland's activities in the wheat trade from 1930 to 1935 were financed by funds secured under Federal guarantee and came to be known as "stabilization" operations. These operations at first involved the withholding of the pool carry-over from the market. In July, 1931, Mr. McFarland began under Order-in-

Council instructions to purchase wheat futures for price stabilization purposes. On his appointment as general manager of the Central Selling Agency he had taken over some 77 million bushels of pool wheat. By May, 1935, he held a maximum of 230 million bushels of wheat and wheat futures. The maximum bank indebtedness of the Agency under government guarantee was \$80 million.

In 1935 the Dominion Government established a national Wheat Board for the second time. This action did not, however, represent abandonment by the Government of its traditional view that Canadian wheat should normally be marketed by private agencies. It is true that one factor in the decision of the Government to re-establish the Board in 1935 was the persistent pressure of wheat producers to have it re-established. Over the period from 1920 to 1935 there were not more than four consecutive years without the open advocacy by producers of some form of monopolized marketing of the Canadian wheat crop. But when the decision to re-create the Board was finally taken it was only partially related to this fact and was much more closely related to political considerations and the necessity for regularization of stabilization activities in view of an impending federal election. The original government measure providing for a new wheat board (Bill 98, first read on June 10, 1935) contemplated a monopoly board—a monopoly *grain* board, in fact, rather than a wheat board. The measure as it was finally passed, however, after consideration by a special committee of the House, established the Board merely as an optional marketing channel which would free the producers from dependence upon the open market system without in any way interfering with that system. Mr. McFarland was appointed Chief Commissioner of the Board.

The development of the Dominion Government's wheat marketing policy since 1935 can now be traced in the record and experience of the Canadian Wheat Board over 15 years of extremely diverse production and marketing conditions.²

Under the Canadian Wheat Board Act the Board, which consisted of three members appointed by the Governor in Council, was

² See *Annual Reports of the Canadian Wheat Board, Crop Years 1935-36 to 1947-48* (Winnipeg, 1936-49). See also the admirable monograph prepared by Dr. T. W. Grindley, former Secretary and, since 1948, one of the Commissioners of the Wheat Board and his associates, *The Canadian Wheat Board, 1935-48* (Ottawa, King's Printer, 1947), pp. 87, and *Summary of Operations of the Canadian Wheat Board, 1935-36 to 1947-48* (Winnipeg, the Canadian Wheat Pools, 1949), pp. 12.

given power to accept deliveries of wheat from producers at a minimum guaranteed price (subject to the approval of the Governor in Council), and to make an equitable distribution to producers of any surplus resulting from the operations of the Board during any crop year, or, in the event of loss, to transfer such deficit to the Dominion Government.

In determining the guaranteed, minimum price the Board had to weigh a variety of economic, social and political factors. On the basis of the financial outcome it seems probable the 1935 price resulted from a fairly shrewd appraisal of (a) fair market value and (b) what the farmer with an average crop needed to "get by." On September 6, 1935, the Board announced a minimum price of 87½ cents per bushel, a figure slightly above the current open market price. The open market price immediately rose to 89 cents and stayed above the Board minimum for six or seven weeks—providing the producer with an optional marketing system. Many producers did, in fact, deliver to the Board during this period and when the market price finally fell below the Board's and remained there for almost eight months self-interest meant that all deliveries went to the Board. A market recovery in June restored the optional marketing plan. The Board finally received 150.7 million bushels—or about 70 percent—of total producer deliveries of 216.3 million bushels in the 1935-36 crop-year.

Replacement of the Conservative government by a Liberal administration following the Dominion General Election of October 1935, involved changes in the personnel and the selling policy of the Board. A new Board with J. R. Murray as Chief Commissioner replaced the McFarland Board at the beginning of December, 1935, and the Minister of Trade and Commerce announced a more vigorous sales policy designed to reduce "the concentration of surplus stocks of wheat in Canada."¹ Crop failures in Argentina and the United States in 1935 and the North American drought in the summer of 1936, enabled Canada to secure a large part of the relatively small world trade in wheat. As a result by the end of the 1935-36 crop year the Board had on hand only two million bushels of the 1935 crop and had reduced the "stabilization" holdings to 82.7 million bushels as compared with the 205.7 million bushels taken over at the beginning of December, 1935. The

¹ *Report of the Canadian Wheat Board, Crop Year 1935-36*, p. 2.

Board's operations showed a final net loss of \$11.9 millions on the 1935 crop after the last sales in November, 1936.

For both the 1936 and 1937 wheat crops the Board fixed a price of 87½ cents, basis No. 1 Northern, Fort William or Vancouver, each year, but the Government in approving this price added a qualification that it would only become effective if the open market price should fall below 90 cents a bushel. With short crops in both Canada and the United States in 1936 followed by a disastrous drought in Canada in 1937 demand improved and prices were maintained well above the 90 cent level so that the Wheat Board accepted no wheat from producers in either crop year. Thus, for two years, the wheat policy of the Government denied farmers the opportunity of pooling their wheat through the Board under market conditions which gave "assurance that initial payments on the Board's minimum basis could be supplemented by substantial distributions on participation certificates."⁴ The Board completed liquidation of the remaining stocks of "stabilization" wheat at a net profit of almost \$9 millions so that the net loss on the Board's operations to July 31, 1938, were reduced to approximately \$2.9 millions.⁵

With the opening of the crop year, 1938-39, the Government's retreat from intervention in wheat marketing came to an end. Both world and Canadian carry-overs were back to normal or even lower but in 1938 world wheat production reached an all-time peak with good yields harvested from a record world wheat acreage. World demand continued at a very low level and prices had fallen sharply, when, after a Royal Grain Inquiry Commission had recommended the continuation of the Canadian Wheat Board,⁶ the Government announced approval on August 4, 1938, of a minimum Board price of 80 cents a bushel. Since market prices remained consistently below this figure all deliveries (amounting to 292.4 million bushels) went to the Board. The eventual loss to the Dominion Treasury on the 1938-39 crop, following final sale of the 86.5 million bushel carry-over in the crop year 1939-40 and a final accounting in April, 1942, was placed at \$61.5 millions.⁷

⁴ H. S. Patton, "Observations on Canadian Wheat Policy since the World War" (*Canadian Journal of Economics and Political Science*, Vol. III, May, 1937, p. 224).

⁵ See *Report of the Canadian Wheat Board, Crop Year 1937-38*, p. 2.

⁶ See *Report of the Royal Grain Inquiry Commission* (Ottawa, King's Printer, 1938), p. 104.

⁷ *Report of the Canadian Wheat Board, Crop Year 1941-42*, p. 23.

Faced with a heavy loss on the 1938 crop the Government had, at the 1939 session of Parliament, secured two important amendments to the Wheat Board Act. (1) the fixed initial price for the 1939 crop was established at 70 cents a bushel thus relieving the Board of this responsibility; (2) deliveries from any one producer were limited to 5,000 bushels in any one crop year.⁸ Further Dominion legislation facilitated organization of agencies to market excess wheat on a co-operative basis.⁹

When a new crop year opened August 1, 1939, the necessity of continued governmental support of wheat prices was indicated by a carry-over of 100 million bushels and a new crop which promised to exceed 500 millions. The outbreak of war a month later brought an improved export demand and open market prices during the period of heavy movement from the farms approximated the Board's initial payment with the bulk of such deliveries going to the Board. With a further improvement in export sales beginning in December, 1939, the open market price began to rise again and, with buying for Canada's largest customer concentrated in the hands of the Cereals Import Committee of the United Kingdom, the open market price levelled out at about 90 cents—or about 20 cents above the Board minimum—from January until the middle of May, 1940.

Encouraged by this situation prairie farmers, having survived ten years of drought and depression, seeded two million extra acres of wheat in the spring of 1940 in the hope of recouping their fortunes in a wartime wheat boom like that of 1914-18. The 1940 wheat crop was scarcely in the ground before export markets for Canadian wheat felt the full impact of the German *Blitzkrieg*, Winnipeg futures dropped 30 cents in one week and at the request of the Board the Grain Exchange set minimum prices below which no trading would be allowed. By midsummer extensions of German conquest and the exigencies of the British blockade had left Portugal the sole remaining customer for Canadian wheat on the continent of Europe. Apart from a few small, scattered and uncertain markets, the Board was left to negotiate block sales to the United Kingdom such as the 50 and 100 million bushel sales in May and August respectively.

⁸ *Statutes of Canada*, 3 Geo. VI, c. 39.

⁹ *Statutes of Canada*, 3 Geo. VI, c. 34. See also G. E. Britnell, "Dominion Legislation Affecting Western Agriculture, 1939" (*Canadian Journal of Economics and Political Science*, Vol. VI, May, 1940, pp. 275-282).

The Board's statutory initial price of 70 cents a bushel continued in effect for the 1940-41 crop year but the storage problem presented by a new crop of 540 million bushels—a near record crop for the second year in succession—to be added to a 300 million bushel carry-over necessitated further regulation of deliveries. To divide available elevator space as fairly as possible, quota permit books based on sworn seeded acreage were issued to producers. A schedule

TABLE I. CANADIAN WHEAT: STATISTICAL POSITION*
(Millions of Bushels)

Crop Year Beginning August 1	Total Carry- over	Crop	Total Supplies	Apparent Domestic Dis- appear- ance	Available for Export and Carry- over	Exports of Wheat and Flour
1935-36	214	282	496	122	374	247
1936-37	127	219	347	99	247	210
1937-38	37	180	217	97 ^b	120	96
1938-39	25	360	385	122	263	160
1939-40	103	521	624	130	493	193
1940-41	300	540	841	129	711	231
1941-42	480	315	795	145	650	226
1942-43	424	557	980	171	809	215
1943-44	595	284	879	179	700	344
1944-45	357	417	773	172	601	343
1945-46	258	319	577	160	417	343
1946-47	74	414	487	162	326	239
1947-48	86	342	428	155	273	195
1948-49	78	303	471	140	331	232 ^c
1949-50	99	371 ^c	470			

* Adapted from *Bank of Canada Statistical Summary*, August 1949.

^b Exclusive of consumption of 5.7 million bushels imported from the United States.

^c Preliminary estimates.

of storage payments on farm-stored wheat was introduced. In view of the probable absence of any effective optional marketing arrangement the 5,000 bushel limitation on deliveries was removed. Because of the abnormal export situation a processing levy of 15 cents a bushel on all wheat utilized for human consumption in Canada was imposed.¹⁰

Bulk sales, covering 220 million bushels, were the main method of wheat disposal for export. Little use was made of the futures

¹⁰ See *Statutes of Canada*, 4 Geo. VI, c. 25. In the crop-year 1940-41, farm storage payments amounted to \$6.1 millions; net revenue from the processing levy (discontinued, July 31, 1941) was \$5.9 millions.

market. With the co-operation of producers and elevator companies it was possible to take delivery of all marketable wheat, but at the close of the crop year the Board held unsold stocks of 254 million bushels from the 1940 crop along with 115 millions from the 1939 crop¹¹ the latter eventually being disposed of at a loss of \$8.2 millions to the Treasury.

From the beginning of the 1940-41 crop year, at least, Canadian wheat statistics had pointed, with harsh urgency, to the necessity of some curtailment of wheat production. (See Table I which shows the annual statistical position of Canadian wheat from the inception of the Wheat Board in 1935.) Faced with a prospective 500 million bushel carry-over in Canada the Government therefore announced, in March, 1941, that wheat deliveries to the Board and to the open market in the crop year 1941-42 would be restricted to 230 million bushels—the amount which it was estimated could be used to meet demand at home and abroad in the year—and that the accumulated stocks as at July 31, 1941, would be carried as a wartime reserve. In the administration of the new policy by the Board the “authorized acreage” for delivery purposes under the quota system was established for each producer on the basis of 65 percent of his declared 1940 wheat acreage. The Board’s statutory initial price of 70 cents was to continue in effect with storage payments to producers on the same basis as 1940-41 “but only on the undelivered portion of the 230 million bushels.” Compensation in the form of acreage bonuses for land taken out of wheat and diverted to summerfallow (\$4 an acre) or to coarse grains or grass (\$2 an acre) was offered. Diversion of wheat acreage to the production of oats and barley in particular was defended in terms of encouraging livestock production, the doubling of bacon and cheese exports to Britain, and the improved domestic market for livestock, dairy and poultry products.¹²

The Government’s program resulted in a reduction of approximately seven million acres or 24 percent in the area sown in wheat. With a light crop total marketings, after all quotas had been lifted, at 228 million bushels in 1941-42 were exactly one-half those of the

¹¹ See *Report of the Canadian Wheat Board, Crop Year 1940-41*, pp. 13-14.

¹² See statements by the Ministers of Trade and Commerce and of Agriculture, *Canada, House of Commons Debates*, March 12, 1941, pp. 1595-1601. See also three government pamphlets (1) *Canada's Wheat Problem*; (2) *A Plan to Reduce Wheat Acreage and Make More Money Available for Necessary War Supplies*; (3) *Less Wheat in 1941 Will Help Win the War* (Ottawa, King's Printer, 1941).

previous year. With a smaller crop and the government's policy of treating former surpluses as wartime reserves, the open market price remained somewhat above the Board price throughout the year so that the Board received only 44 percent of farm deliveries in 1941-42 as against almost 90 percent of the large 1940 crop. Two sales, each of 120 million bushels were made to the United Kingdom (one in November, 1941, the other in May, 1942), and the total Canadian wheat carry-over was reduced by nearly 60 million bushels during the year. It should, however, be noted that since the greater part of the wheat economy was ill adapted to the government's diversification program the economic and social costs, particularly to Saskatchewan, were not inconsiderable.¹²

Government wheat policy for the crop year 1942-43 reflected no change from the previous year beyond the fact that the Board's fixed initial price was increased to 90 cents (after being held at 70 cents for the previous three years) with marketings limited to 280 million bushels for Western Canada compared with 230 millions for all Canada in the previous crop year. Wheat acreage reduction payments were continued, the reduction in wheat acreage was maintained, and the expansion of feed grain acreages was accelerated with the establishment in March, 1942, of minimum prices for oats and barley. In line with its over-all price control policy, the government held the price of wheat entering into domestic consumption to 77½ cents per bushel by payment through the Board of a drawback to millers.

With a very large wheat crop and record productions of oats and barley yielding large marketable surpluses of these grains, delivery quotas for wheat were increased very slowly to a maximum of 15 bushels per "authorized acre" and large stocks of wheat accumulated on farms in the main wheat areas, increasing the pressure to transform the wheat economy into a coarse grain and livestock economy. Thus, in the three years from 1940 to 1942 Canadian wheat acreage was reduced nearly 40 percent—from 28.7 to 16.9 million acres. Early in 1943 improved demand became a noticeable factor so that by March the open market price had moved above the Board's initial price and 38 percent of the total

¹² See G. E. Britnell, "The War and Canadian Wheat," (*Canadian Journal of Economics and Political Science*, Vol. 7, August, 1941, pp. 397-415), L. A. Skeoch, "Changes in Canadian Wheat Policy" (*Ibid.*, Vol. 9, Nov., 1943, pp. 566-569), V. C. Fowke, "Effects of the War on the Prairie Economy" (*Ibid.*, Vol. 11, August, 1945, pp. 373-387).

"authorized deliveries" were marketed through the Exchange and 62 percent through the Board.

On September 27, 1943, the Dominion Government announced a complete change in wheat policy which may be summarized under five heads:

- (1) The discontinuance of wheat trading on the Winnipeg Grain Exchange;
- (2) The raising of the fixed initial price to producers from 90¢ per bushel to \$1.25 per bushel for No. 1 Northern wheat;
- (3) The purchase by the Board, on behalf of the Dominion Government, of all stocks of unsold wheat in commercial positions in Canada on September 27th, 1943;
- (4) The closing out of the 1940-41, 1941-42 and 1942-43 Wheat Board Crop Accounts on the basis of closing market prices on September 27th, 1943;
- (5) The use of Government-owned wheat (Items 3 and 4 above) to meet requirements under Mutual Aid and to provide wheat for subsidized domestic purchasers.¹⁴

The new policy gave the Wheat Board a monopoly of Canadian wheat marketing. It made for efficient allocation of supplies to domestic and to export markets and a more effective utilization of storage and transportation facilities; it helped to restore the income of the western wheat producer which had been depressed by low prices and low delivery quotas while at the same time the problems of the Government's price control policy were eased by the large stocks which it now controlled.¹⁵ Government purchase of the unsold stocks from the 1940, 1941, and 1942 crops at the closing price on September 27, 1943 (which was \$1.23½ basis No. 1 Northern in store Fort William) made it possible to arrange final payments to producers on all these crops within the next twelve months (see Table II).

The change in wheat marketing policy which was made in 1943 placed the Dominion Government in a strategic position for the formulation of policy for the post-war period. The Government made it clear that the first consideration would be to supply Canadian wheat in maximum quantities to meet the desperate food requirements of European countries. For the longer run the Government has consistently pursued the goal of greater market stability

¹⁴ See *Report of the Canadian Wheat Board, Crop Year 1943-44*, p. 8.

¹⁵ See Skeoch, *op. cit.*

for the wheat economy. Two decisive steps were taken in the implementation of this policy in 1946: the negotiation of the United Kingdom Wheat Agreement, and the creation of a five-year national pool for Canadian wheat.

The United Kingdom Wheat Agreement as announced July 24, 1946, provided that the Canadian Government would supply 600

TABLE II. CANADIAN WHEAT BOARD PAYMENTS^a
(Basis No. 1 Northern Fort William)

Year	Initial Payment \$ per bus.	Participation Payment \$ per bus.	Total \$ per bus.
1935-36	0.875		0.875
1936-37	0.875}	(No deliveries to Wheat Board)	0.875
1937-38	0.875}		0.875
1938-39	0.80		0.80
1939-40	0.70		0.70
1940-41	0.70	0.06215	0.76215
1941-42	0.70	0.15336	0.85336
1942-43	0.90	0.12502	1.02502
1943-44	1.25 ^b	0.12146	1.37146
1944-45	1.25	0.18677 ^c	1.43677

Five-year Pool		Nov. 26/46	Apr. 1/48	Apr. 1/49
1945-46		1.25	0.10	0.20
1946-47		1.35		0.20
1947-48	Aug. 1/47 to Mar. 31/48	1.35 (1st basis)	0.20	0.20
	Apr. 1/48 to July 31/48	1.55 (2nd basis)		0.20
1948-49	Aug. 1/48 to Mar. 31/49	1.55 (1st basis)		0.20
	Apr. 1/49 to July 31/49	1.75 (2nd basis)		
1949-50	Aug. 1/49-	1.75		

^a Adapted from *Summary of Operations of the Canadian Wheat Board*.

^b Changed from \$0.90 to \$1.25 on 27 September, 1943.

^c Participating payment was \$0.18677 for top four grades and sub-grades; for No. 5 and lower, the payment was \$0.20677 per bushel.

million bushels of wheat to the United Kingdom over the four crop years, 1946-47 to 1949-50, 160 million bushels for each of the first two and 140 million bushels for each of the last two years. For the first two years the price was to be \$1.55 per bushel basis No. 1 Northern Fort William, Vancouver or Churchill; for the third and fourth years the price was to be negotiated above minima of \$1.25 and \$1.00 for the respective years. Exports outside the

contract would move at "world" prices with special regulations concerning the price to Canadian millers for domestic purposes.

As the domestic complement of the United Kingdom Agreement the Government announced the creation of a five-year pool for Canadian wheat. The arrangement here was that the Wheat Board would continue as the sole purchaser of Canadian wheat and that the crop years 1945-46 to 1949-50 would constitute a single pool, the producers to receive an initial payment on delivery with participation certificates to represent their further equity. The initial payment for 1946 was set at \$1.35 and a 10 cent interim payment was declared on deliveries for the 1945-46 crop year to add to the \$1.25 which had already been paid on such deliveries. Amendments to the Wheat Board Act in March, 1947, extended the monopoly control of the Board to July 31, 1940, the expiry date of the United Kingdom Agreement and of the five-year pool.

With Canada entering upon the final year of the Agreement and of the national pool, only a progress report of their results can be given. Wheat moved to Britain according to contract for the crop years 1946-47 and 1947-48 at \$1.55 per bushel. For the first of these years the Board averaged \$2.43 per bushel for wheat exported outside the contract (Class II wheat); for the second year the average was \$2.88. On the basis of negotiation the price of wheat for Britain for the years 1948-49 and 1949-50 was set at \$2.00 per bushel. Meanwhile the price of wheat for domestic milling purposes varied from \$1.25 to \$1.55 to \$2.00 per bushel. It can be readily seen that the Board accumulated substantial funds over and above the \$1.35 initial payment. With these funds the Board has made interim payments on participation certificates, 20 cents per bushel on April 1, 1948, and an additional 20 cents on April 1, 1949. With each interim payment made on past deliveries the initial payment was correspondingly raised for future deliveries. Canadian farmers have thus received \$1.75 per bushel, basis No. 1 Northern Fort William, for their deliveries since August 1, 1945, and are receiving this amount as the initial payment for deliveries from the 1949 crop.

Table II provides a concise summary of the Wheat Board's payments on a bushel basis from its inception in 1935.

The Canadian producer and the Canadian Government are not alone in seeking to introduce a greater measure of stability into

the world wheat trade. In March, 1949, the representatives of some forty countries signed the International Wheat Agreement in Washington. This agreement, since ratified by the requisite countries to put it into effect, marks the culmination of nearly two decades of effort. The agreement covers the four-year period from August 1, 1949, to July 31, 1953, and carries the commitment of five exporting countries to supply and of 36 importing countries to accept quantities of wheat totaling approximately 450 million bushels of wheat annually. The exporting countries and their respective annual supply commitments are: Canada, 203 million bushels; United States, 168 million; Australia, 80 million; France, 3.3 million; and Uruguay, 1.8 million. Chief among the importers is the United Kingdom, committed to take 117 million bushels annually. Significantly absent from the list of signatory exporters are Argentina and Russia. The agreed quantities are to move at prices limited to specific maximum and minimum figures. The maximum is \$1.80 per bushel for each of the four years. The minimum is \$1.50 per bushel for the first year and 10 cents less for each succeeding year, or \$1.20 for the fourth year.

It is too early to forecast the outcome of the International Wheat Agreement with any degree of certainty. In fact, the future course of the Agreement is hardly relevant to Dominion wheat marketing policy at the present time. The significant point in current circumstances is that governments of wheat exporting and importing countries no longer regard state trading in wheat as a temporary expedient to be abandoned at the first signs of the return to post-war normality. This is in sharp contrast to the general policy pursued in the years following the first World War. Though particular national wheat boards and international agreements may succeed or fail we are not likely soon to see a restoration of the open market system in the international wheat trade. So far as Canada is concerned the Government has already extended monopoly control of wheat to 1951 and at no time has the Canadian Government intimated that the open market system would be restored then or at any later date.

THE PROPOSAL TO MARKET COARSE GRAINS THROUGH THE CANADIAN WHEAT BOARD

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THE Government of Canada has recently announced its intention, beginning with the new crop year starting August 1, 1949, of making the Canadian Wheat Board the sole marketing agency for oats and barley produced and sold in the Prairie Provinces of Manitoba, Saskatchewan and Alberta. Since September of 1943 the Wheat Board has been the sole marketing agency for wheat in this designated area. The initial price paid to the producer has been fixed by the Governor-in-Council, that is, the Cabinet, while surpluses realized on the disposal of this wheat have, after the deduction of expenses, been pro-rated back to those farmers delivering wheat. The cash and futures markets are closed.

Although the ownership of the elevator system remains in the hands of private firms, or co-operatives, the Canadian Wheat Board Act of 1935 confers upon the Board the power to regulate the deliveries of wheat, oats, barley, rye and flaxseed to these elevators. The Board issues a delivery permit book to each farmer and may, at its discretion, establish delivery quotas. Also, the Board may require that, unless delivered under a permit book, grain may not be loaded onto a railway car without the permission of the Board. The Act gives the Board a monopoly over all inter-provincial and export trade in wheat and by an amendment of March 19, 1948, extends this monopoly to oats and barley.¹ At the time of writing, trading on the Winnipeg Grain Exchange in cash and futures contracts for all grains, other than wheat, is still taking place.² It is assumed that with the Board undertaking the marketing of oats and barley produced in the designated area in inter-provincial and export trade the cash and futures market will not be able to operate once existing contracts are cleared.

Although Bill 135 was passed more than a year ago the Government refused to proclaim this amendment until the governments

* The writer wishes to acknowledge careful criticism of an earlier draft of this paper, by W. M. Drummond, E. C. Hope, W. J. Parker, M. W. Sharp and A. M. Shaw.

¹ Bill 135, Fourth Session, Twentieth Parliament, 11-12 George VI, 1947-48.

² In the case of wheat, trading has never been legally prohibited but has simply ceased to occur because there isn't enough wheat outside the control of the Wheat Board to make it possible.

of the three Prairie Provinces had passed complementary legislation.³ This complementary legislation, making the Wheat Board the exclusive marketing agency, was desired inasmuch as the Government feared that without it the powers given by the amendment might not be sufficient to ensure an effective monopoly in oats and barley marketing. The governments of the Prairie Provinces passed the requested complementary legislation but not before the Premier of Manitoba had asked some very searching questions as to how these grains were to be priced. These questions were never satisfactorily answered. Mr. Garson has since joined the Dominion Cabinet and, if such pricing criteria have already been devised, they have not been made public.

The proposal to place the marketing of these grains under the exclusive jurisdiction of a government board, with the consequent emasculation of the cash and futures market, has had the unqualified support of the Canadian Federation of Agriculture. Farmers in Western Canada have exhibited chronic dissatisfaction with the Grain Exchange and, at their request, this institution has been periodically investigated. Professor Fowke, after recording the appointment by the Dominion Government of seven Royal Commissions to investigate the grain trade between 1899 and 1939 has this to say:

More than any other thing the wheat growers criticized the Winnipeg Grain Exchange with its organized speculation on the futures market. . . . The prairie farmers have attacked this organization for the past forty years as the symbol of their exposed and residual position within a price system in which other groups have entrenched themselves behind tariffs, price controls, and trade association agreements. For forty years Canadian agricultural commissions have defended the Grain Exchange, again as a symbol, but for them a symbol of the beneficence of the price system.⁴

Farmers in the specialized grain growing areas of the Prairie Provinces are subject to a high degree of both output and price

³ In a letter to the Hon. Stuart Garson, Premier of Manitoba, Mr. Howe, Minister of Trade and Commerce in the Dominion Government wrote: "Complementary legislation in Alberta, Saskatchewan and Manitoba is required to make Wheat Board prices effective. Provincial legislation in Ontario is desirable, but perhaps not necessary, as the competitor situation as between Western coarse grains and Eastern coarse grains will tend to hold prices in line." See *Manitoba's Position on Oats and Barley Marketing*, a copy of the correspondence between Hon. Stuart Garson and Rt. Hon. C. D. Howe, Minister of Trade and Commerce, King's Printer for Manitoba, Winnipeg, 1948, p. 11.

⁴ V. C. Fowke, *Royal Commissions and Canadian Agricultural Policy*, *The Canadian Journal of Economics and Political Science*, Vol. 14, No. 2, (1948), p. 173.

uncertainty. Yields vary widely from year to year. When low yields coincide with periods of low prices, as was the case in the mid-thirties, the farmers' position is desperate. During a period of depression the terms of exchange turn against agriculture; farmers seek, therefore, to escape from the open market and to secure some type of administered price which will be less subject to cyclical fluctuations. Their experiences with a government wheat marketing monopoly have been rather satisfactory, partly because these boards have been in operation either during, or immediately after, the last two wars when the market prices of bread grains were extremely high. The prairie farmer is inclined to ask why, if he is to have a government wheat marketing monopoly, he should not have the same board market his oats and barley.⁵

The structure of the market for oats and barley is essentially different from that for wheat. Canada normally exports about two thirds of her wheat crop. The price obtainable in the export market offers a convenient guide to the government in fixing a price to the domestic consumer. At the present time the price of wheat for food and feed in Canada is the same as the price specified in the export contract with the United Kingdom, with, of course, allowance being made for differences in grade. Since roughly 95 percent of the total output of oats and 85 percent of that of barley is used within the country, and since there is an even less clearly discernible world market price for these grains, it seems unlikely that the export price will provide an adequate guide even if it were considered desirable to establish the domestic price at this level. Certainly the price of feed grains in the United States must be considered in fixing the price to the feeder. American corn, subject to a duty of eight cents per bushel, may be imported if its price is sufficiently lower than the domestic prices of coarse grains. Since corn prices are supported under the parity program in the United States the use of laid down corn prices as a guide would raise the price of feed grains to the Eastern feeder by the amount of the effective price support plus the tariff.

Coarse grains compete with wheat for available acreage in the

⁵ The first Canadian Wheat Board of 1919 was a monopoly; it purchased all wheat offered for sale in commercial channels. The second Wheat Board of 1935 bought at a pre-determined initial price but the market for cash and wheat futures was left open until September of 1943. During this period the farmer had the option of selling either to the Board or on the open market depending upon the relative prices offered.

Prairie Provinces. Of the 60 million acres cultivated in these three provinces roughly 26 million is seeded to wheat, 14 million to coarse grains and the remaining 20 million are summerfallowed. The coarse grain acreage is concentrated in the black soil zone to the north where it claims a third of the cultivated acreage with a like proportion being devoted to both wheat and summerfallow. This is the mixed farming area where hogs, beef and dairy cattle enterprises are found on many farms, although wheat is still the primary cash crop. On the short grass plains to the south coarse grains claim some 10 percent of the cultivated acreage with wheat occupying nearly a half and summerfallow the remaining 40 percent.⁶

A high proportion of these coarse grains are fed on the farms where grown. Farmers' marketings average about 38 percent of production for oats and 46 percent for barley. Under the Freight Assistance Program roughly half the oats and barley marketed in Western Canada have been shipped to Eastern Canada and British Columbia. Although statistics for pre-war shipments are not available they are known to have been much smaller.

The operator of a typical one-hundred acre farm in Ontario or Quebec finds that he can increase his net farm income by intensifying production. Much of the land in Central Canada as well as in the Maritime provinces of New Brunswick and Nova Scotia is better suited for the production of grass than grain. Since 1941 the Dominion Government in an effort to expand the output of live-stock, dairy and poultry products has paid the freight on some 753 million bushels of grain moving from the Prairies into Eastern Canada and British Columbia.⁷ Between 1943 and 1947 farmers in Eastern Canada imported from the west as much feed grain as they, themselves, produced. Prior to the removal of price ceilings on grains and livestock in October of 1947 the feeder was also granted a "drawback" on purchased grain used for feed.⁸ These subsidies

⁶ Estimates are derived from unpublished data compiled by the Canadian Wheat Board from producers' delivery permits.

⁷ Data from Feeds Administration, Dominion Department of Agriculture, Ottawa.

⁸ The practice of allowing a "drawback" to the feeder of wheat is inequitable in its application as between feeders in Western Canada buying grain and those producing all or part of their own feed grains. A similar criticism may be made of the practice of distributing "equalization payments" on coarse grains. During the war and immediate post war years anyone exporting coarse grains to the United States was required to secure a permit and to pay to the Board the approximate amount by which the price in the United States exceeded that in Canada. This device per-

on feed grain, shared by the farmer and consumer, have served to expand the domestic market for western feed grain. The Canadian Federation of Agriculture urges their continuance as a permanent part of our agricultural policy.

How Will the Government Price Feed Grains?

This is certainly the fundamental issue which must be met once the open market is closed and the buying and selling prices of oats and barley are fixed by the Cabinet.⁹ The first reaction of Mr. Howe, Minister of Trade and Commerce, whose department is responsible for the administration of the grain trade, was "to look to the Canadian Federation of Agriculture to recommend prices for oats and barley satisfactory both to producers and feeders."¹⁰ Since the Federation represents both the grain growers in the west and the feeders in the east, one may assume that the reception accorded to this suggestion was something less than enthusiastic.

Despite the obvious advantages of this inter-regional trade in feed grains it complicates the problem of administered pricing. Prairie farmers would like to sell their surplus oats and barley at prices which would, over a period of years, maximize their receipts from such sales; eastern farmers, on the other hand, would like to pay as low a price as is consistent with an adequate and assured supply of feed grains. There is, then, a rather sharp divergence of interest between the two groups of producers as to the price which should be fixed for oats and barley.

Evidence of this divergence of interest between the producer and feeder of coarse grains is to be found in a resolution passed by the Western Agricultural Conference. This Conference, which is made up of delegates representing organized agriculture in the four

mitted exports while protecting the domestic price ceiling. Receipts from "equalization fees" were pro-rated back to all farmers who had delivered grain.

The real cost to the farmer feeding grain which he had grown was the selling price of that grain. This was greater than the purchase price to the non-grain-growing feeder, in the case of wheat, by the amount of the "drawback" plus the participation payment, in the case of coarse grains by the "equalization payments." Although all of these payments, except the participation payment on wheat, have now been discontinued, this situation could recur if, once the marketing of coarse grains are brought under the Wheat Board, the price to the producer is fixed at a higher level than the price to the feeder.

⁹ Subsection (c), section 29A of Bill 135, An Act to Amend the Canadian Wheat Board Act, 1935, provides that the initial prices paid to the producers of oats and barley are to be fixed by the Governor-in-Council, i.e., the Cabinet. Presumably the Board is to offer coarse grains at prices approved by the Cabinet.

¹⁰ *Manitoba's Position on Oats and Barley Marketing*, p. 8.

western provinces, met in Saskatoon on January 20 of this year. The resolution dealing with coarse grains was as follows:

"that a joint effort be made to enable the Canadian Wheat Board to be the sole marketing agency for coarse grains and that any legislation giving the Canadian Wheat Board the same exclusive powers over the marketing of other grains as it now exercises over wheat, should be based on the principle that the Canadian Wheat Board should be an agency operating in the interests of grain producers, with a duty at all times to sell grain for the best available price whether in export or domestic markets, and should not be used as an instrument of government policy to limit domestic prices."¹¹

This resolution immediately raises the question as to what the Conference meant when they asked that the "Board should be an agency operating in the interests of grain producers, with a duty at all times to sell grain *at the best available price* whether in export or domestic markets." The Wheat Board Act states that the Board "shall sell and dispose of grain . . . at such prices as it considers *reasonable* with the object of promoting the sale of grain produced in Canada in world markets."¹²

One might conclude that the Conference would have the Cabinet, or the Board, so fix the selling prices of coarse grains as to maximize the Board's receipts from such sales over any given period of time.¹³ If this were done the government would, in effect, be establishing a monopoly on behalf of the western grain grower.

The Ontario Federation of Agriculture apparently does not believe that the Board, although the agent of the producer, need price feed grains in this way. At their annual meeting they passed the following resolution:

Coarse Grains Marketing

Whereas 72 percent of farm income in Ontario is received for livestock products;

And whereas reasonable stability in feeding costs is necessary to build and maintain this industry at high levels;

And whereas speculative fluctuations in the prices of coarse grains do not promote this necessary stability;

¹¹ As reported in the Manitoba Co-operator of January 27, 1949.

¹² The Canadian Wheat Board Act 1935, subsection 1 of section 5 of Part I.

¹³ The period of time considered may prove very important. Prices which would maximize receipts over a day or a week might yield less than maximum receipts over a longer period because of their effect upon feeders' production decisions. If the objective is to adjust price at that level at which the price elasticity of demand is unity, the price fixing agency might well find the elasticity of demand to be greater over a longer period of time and hence warrant a lower price.

Therefore be it resolved that the Ontario Federation of Agriculture in annual meeting assembled ask the Canadian Federation of Agriculture to press whatever negotiations are necessary to have coarse grains marketed in the prairie provinces come under the control of the Wheat Board, and in pressing this request, we agree that:

1. The Board should be the agent of the producers of coarse grains.
2. The selling policy of the board should be based on the free supply and demand situation for coarse grains both in Canada and in export markets but the Board should take steps to see that adequate feed reserves are maintained in Canada to safeguard the livestock industry which, in the long run, is the most important market for coarse grains produced in Canada.
3. The Board should have an advisory committee recommended by the Canadian Federation of Agriculture which committee should be representative of the growers and the feeders of coarse grains.

It is apparent that farm leaders in both eastern and western Canada believe that the government can establish prices which are "fair to producers and consumers alike." Both groups are anxious to escape from short run fluctuations in price which they regard as unnecessary. Any reduction which can be achieved in price variation and/or any increase in price certainty through the announcement of minimum or maximum prices in advance may well lessen the costs of producing both grain and livestock and represent a contribution to the general welfare.

While the resolution of the Ontario Federation stresses "reasonable stability in feeding costs" it also concurs in the fixing of selling prices at a level "based on the free supply and demand situation for coarse grains both in Canada and export markets." The Federation may have anticipated some stabilization in the price of coarse grains as a result of the maintenance of "adequate feed reserves."

There is, in the opinion of the writer, a distinct possibility that it is possible to devise and apply a system of administered prices which will do a better job, in terms of resource allocation, of getting grain and livestock products produced than the open market will do. It is not apparent, however, that such a system has been devised prior to the launching of this present program of state marketing. Western farm leaders do not want state marketing of coarse grains in order to secure a monopoly price for their product. They seem inclined to believe that it is possible to make the Wheat Board the sole marketing agency and at the same time retain the open market as a guide to the Board in fixing initial prices to the producer and selling prices to the feeder. Since the Board in marketing the

western crop will control over 90 percent of the supplies of coarse grains entering into commercial channels for the country as a whole the Board's selling price will determine the market price rather than the converse. Nevertheless, Mr. Howe, in announcing minimum initial prices to be paid producers in 1949-50, also stated that the Board's selling prices will be set from day to day and will depend upon the strength of demand.¹⁴ It might be inferred that Mr. Howe anticipates guidance from the market in setting these prices. In any event prices to feeders will not be forward prices in the sense of being announced far enough in advance to reduce the price uncertainty confronting livestock producers.

The obvious danger is that the buying and domestic selling prices fixed by government for oats and barley will become "political prices." Rather than being established upon the basis of economic criteria, i.e., equating supply and demand, government will be subject to a strong temptation to fix grain prices at that level which will satisfy a maximum number of voters. Pressure may well be brought to bear upon the government by those speaking on behalf of the western producer to fix the price at a higher level; by those speaking on behalf of the eastern feeder to fix the price at a lower level. Caught between these two forces any government may well find that the easiest solution from a political point of view is to satisfy both groups, and, rather than setting one price for both sellers and buyers,¹⁵ to establish two prices and then to bridge the gap between the higher price to the grower and the lower price to the feeder with a subsidy. The Canadian consumer should not prove too unhappy with this arrangement since he would indirectly benefit from a lower price of meats, poultry and dairy products. Having satisfied three groups, the government in power may find it possible to ignore the complaints of the taxpayer who would be called upon to make up any deficits incurred by the Wheat Board on its oats and barley accounts.

Prices determined in this way almost inevitably lead to trouble—and to ever more far-reaching controls. There exists a very high degree of inter-dependence among the prices of our various farm products. If the price of any one of them is pulled out of line by means of controls the effects are transmitted to the production,

¹⁴ As stated in an official press release of July 20.

¹⁵ Or, to be more specific, to make the Board's selling price equal to the price to the producer plus the cost of handling and transportation.

consumption and hence price, of the other uncontrolled products. If, for example, the price to the producer of coarse grains is fixed at too high a level relative to the price of wheat, farmers will seed too many acres to oats and barley and too few to wheat. If the selling prices of oats and barley are set too high relatively to the prices of hogs, cheese, butter or eggs, the output of these products will fall off. The control of coarse grain prices may well lead to control of the prices of those products which coarse grains are used to produce. Canada exports more than one-fourth of her total output of all farm products; she must, therefore, be prepared to produce those products which are in export demand and to sell them at competitive prices. This requirement precludes the setting of a fixed price for a product in Canada at a level higher than the export price unless the government is prepared to subsidize exports.

In the remainder of this paper we propose to examine briefly some of the factors which the government will need to take into consideration in fixing the buying and domestic selling prices of coarse grains. To begin with, it would appear that, since the acreage seeded to these various grains in many sections of the prairies is fairly sensitive to relative price, the relative quantities of wheat, oats and barley desired must be carefully evaluated when fixing the price to the producer. Moreover the price to the producer may not be fixed independently of the price to the feeder, or at least not after storage facilities are filled. The quantities of these grains which the government will wish to see produced will vary with the demand for wheat and feed grains and the strength of this demand must be evaluated in terms of specific selling prices as well as other relevant parameters.

In selling the Board is not obligated to ask the same prices which it pays to the producer, or even to fix its selling prices in such a way as to preserve the same ratio among them as existed among the buying prices. If one of these three grains is overpriced on either the buying or selling side the Board will soon find itself in possession of excessive stocks of that grain. The principle involved in fixing prices so as to equate supply and demand is that of permitting the choices of the ultimate consumer to be reflected back to the producer in order to permit the latter so to allocate his resources as to satisfy the consumer's preferences. If the Cabinet's objective in pricing these grains is to equate supply and demand it seems quite possible, by falling back upon past experience of producers' and feeders'

response to price and by being given some leeway between buying and selling prices through resort to monies appropriated by Parliament, that this objective may be attained. One marked advantage of this method of pricing over that of the open market is that it would permit forward pricing—i.e., informing the producer of the respective minimum selling prices of his grain before he ever puts his seed into the ground.

In pricing feed grains careful consideration will also need to be given the relationship between grain and livestock prices. The output of livestock, dairy and poultry products varies, not only with the prices of these products, but also with the relationship between the prices of these products and the price of feed grains. If livestock and poultry products are to be sold in the open market, supplemented where possible by export contracts, the government will be in control of one of the important determinants of output and hence, indirectly, of price of some, at least, of these products. It is true that the government has more direct means of controlling the price of certain of these products, e.g., by negotiating export contracts for hogs, cheese and eggs or through floor prices for butter. So long as our beef cattle are permitted access to the United States market at prices anywhere near their present level the prices of feed grains will have little effect upon the supply of beef.

In the event that we continue to be able to negotiate export contracts for livestock products with the United Kingdom the selling prices of feed grains might be fixed at a level designed to fill these contracts and to satisfy the domestic market at comparable prices. With reduced contracts and shrinking non-contract export markets for livestock products, feed grains might be priced high enough to reduce the supply of such products to fit these markets. This approach might encounter heavy opposition from the feeders of coarse grains; it might also involve production or marketing controls on grain if supply exceeded demand once storage stocks became large.

However the farm pressure groups on whose insistence this step is being taken do not expect the government to attempt merely to establish "equilibrium" prices. They favor government marketing because they believe it offers a means of reducing cyclical variations in the price of grains. In other words they expect the buying prices of oats and barley to be fixed at higher than market levels during periods of low market prices and, perhaps, lower than mar-

ket levels when grain prices are high. The support accorded the wheat contract with the United Kingdom would seem to indicate that prairie grain producers will accept moderate prices if some degree of longer-run price stability is assured to them.

The necessity of satisfying this further requirement is going to complicate greatly the government's pricing problem. Prices are now to be used as means of reducing those wide fluctuations in farm income which result from cyclical variations in the price of farm products. If during a depression, in order to support or stabilize farm income, the prices of oats, barley and wheat are held at levels higher than those needed to establish equilibrium between supply and demand, it will be necessary either to support the prices of rye and oilseed crops or limit the acreage or deliveries of the three grains whose prices enjoy support. Otherwise farmers will simply fail to produce those crops whose prices are not supported. In the park belt this may also apply to the acreages normally seeded to forage crops where such land may be used for grains.

No provision is made for the accumulation of a fund from the excess of selling over buying prices during periods of high grain prices to be used to keep buying prices above selling prices when grain prices are low. Bill 135 limits the pooling period for coarse grains to one crop year thus preventing pooling over a period long enough to cover years of both high and low prices. Probable deficits incurred by the Wheat Board on its coarse grain accounts during periods of low grain prices will be made up from the Consolidated Revenue Fund while surpluses will be pro-rated back to producers. This means transfer payments from the taxpayer to the farmer over a period of years. One disturbing feature of this policy is that once the open market has been closed there is no reliable way of computing the volume of such transfer payments.

The Agricultural Prices Support Act of 1944 excluded wheat from the products whose prices it might support since this grain was already being marketed by a government agency. In fairness to the western farmer it should be said that he is not supporting government marketing of coarse grains for the purpose of exacting subsidies from the federal treasury. By selling through a pool every farmer will receive the same price for the same grade irrespective of the date within the crop year at which he makes delivery of his grain. Both producers and feeders expect a more stable price of feed grains than under an open market. The first of these two advan-

tages might be secured by means of a voluntary pool.¹⁶ Government storage operations might serve to reduce substantially those fluctuations in price arising from variations in yield. It is by no means certain that a state marketing monopoly is the best means of attaining either of these two objectives.

The initial price which the Government has now decided the Board shall pay for oats and barley is the support price announced on March 15, 1949. Initial prices are thus being used as a means of supporting the incomes of coarse grain producers just as with wheat. Actually, of course, the same farmers produce both wheat and coarse grains. In the event that the Board's initial buying price is higher than its domestic selling price coarse grain producers may prove reluctant to feed their grain to livestock in competition with specialized feeders who can obtain feed grains at a lower price from the Board. There appears to be no practical administrative method of buying feed grains from the grower-feeder at the higher price and selling it back to him for feeding at a lower price.¹⁷

The difficulties of establishing prices for coarse grains which will serve the dual function of equating the supply of and the demand for these grains and at the same time providing stabilized prices in the face of fluctuations in the level of employment and national income seem virtually insurmountable. If the latter objective is considered the more important, resort will likely be had either to marketing or production controls to achieve the former.

This nationalization of the marketing structure for coarse grains may have international as well as national implications. Canada would seem to be falling in with the present trend toward state trading observable in so many other countries. Once the government had assumed the responsibility of marketing Canadian wheat in peace as well as war there seemed no good reason to the farmer why it should not market coarse grains. There may be equally cogent reasons why government should market the beef, hogs, cheese and eggs which are produced from coarse grains.

The economist has a prejudice in favor of using the price system as a means of informing producers what products consumers are willing and able to buy. Many writers on the economics of socialism

¹⁶ The Government has asked the Canadian Wheat Board to conduct a voluntary pool for flaxseed in 1949-50. The initial price is fixed at \$2.50 per bushel for No. 1 C.W. flaxseed basis in store Fort William.

¹⁷ See above footnote 8.

would retain the price system as the most effective means of performing this function.¹⁸ If government control of the price structure for grains is to be used as a means of stabilizing farm income over the ups and downs of the business cycle the implications of such control need to be thoroughly explored. Few would quarrel with the objective. The important question is what is the cost and what kind of by-products come wrapped in the same package with price stabilization. Since the government has indicated its intention of implementing Bill 135 at the beginning of the new crop year, August 1, more of the answers will have been placed on the record before this article is published.¹⁹

¹⁸ See Abram Bergson's essay, *Socialist Economics*, in *A Survey of Contemporary Economics* edited by Howard S. Ellis, Blakiston, 1948, pp. 432-440.

¹⁹ A Canadian Wheat Board statement issued on August 4 and after the above article was written, gives some idea of the Board's resale plans. The Board is not taking over the very considerable stocks of old crop oats and barley which were delivered by farmers prior to August 1st, and which are still in the process of being marketed by the present holders. This means that for some time after the marketing of the new crop begins there will be two classes of coarse grains for sale, the new crop stocks handled by the Wheat Board and the old crop stocks following the open market route. Since most of the old crop stocks have been hedged in the Winnipeg futures market for October and December delivery, open market trading in grain for future delivery as well as in cash grain is bound to continue until marketing of the old stocks is finally completed.

In view of this situation it is not surprising that the Wheat Board should now announce its intention of making general use of the existing facilities including the future trading facilities of the Grain Exchange. At present the Board is offering to sell grain at daily quoted prices in store the Lakehead, both for immediate and future shipment, to dealers for distribution to users. These selling offers are made in competition with the private trade which is marketing the carryover from last year's crop. For the time being at least, therefore, the Board has left the way open for eastern dealers to continue buying as heretofore. It is difficult to see how this open market system can possibly continue in operation once the old crop stocks have been finally disposed of.

THE LOGICAL FOUNDATIONS OF ECONOMIC RESEARCH

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TWENTY-FIVE years ago agricultural economists were deeply concerned over the need for improved methods of research. The efforts in this direction and the assistance of the Social Science Research Council are well known, and need not be recounted here. Whatever else may be said about this effort, it gave impetus to great improvement in statistical methods of economic research, which has been of inestimable value; some of the top flight statisticians of the country are to be found among research workers in agricultural economics.

There is again a deep sense of uneasiness about methods of research in agricultural economics. But now, if I sense the situation correctly, there is little expectation that a well chosen committee might go to some authority, such as Karl Pearson, and find adequate answers to our problems. What has happened, is that now the whole underpinnings of economics itself are open to question. Consequently, just as it is no longer possible to find an adequate research method to apply to our problems, so it is no longer possible to find an adequate "pure" economics to apply to the economic problems of agriculture. Two conclusions seem obvious: (1) that comprehensive methods of investigation must be devised by agricultural economists out of our own investigation, and (2) this presents an unusual opportunity to contribute to economic and social science theory generally if we have the wit to do the job before us.

As I have tried to analyze and understand economic theory and scientific method in economics I have become impressed by both the need for, and the possibilities of, a restatement of our problems in the light of logical theory. Such an effort requires a consideration of the very foundations of methodology in economics. This paper reports a part of an attempt to state the methodological issues in economics by an examination of the relevant issues in economic theory, logical theory and statistics. From the viewpoint of systematic generalization, logical theory is both more inclusive and more fundamental. Consequently this essay takes the form of analyzing the whole complex of issues from the perspective of logical analysis.

I have thought for a long time that the issues in economic analysis might be clarified by systematic recourse to logical theory. For example, it appeared likely that a thorough study of John Stuart Mill's *Logic* might reveal the true theoretical foundations of classical, and possibly neo-classical, economics. Furthermore, I supposed that modern logical theory might help to explain the peculiar directions of modern theorizing in economics. I do not claim to have mastered the several theories of logic or any one of them. But the work of colleagues and some of my students, as well as my own effort, has deepened my conviction that a real understanding of logical theory by economists would greatly strengthen our work in research and theoretical economics. As I have read current philosophical theory, the works of Dewey and G. H. Mead have been most concerned with the issues that grew out of my attempts to understand economic analysis. I therefore set out to achieve sufficient mastery over their works, especially Dewey's, to enable me to examine the methodological issues in economics in the light of their insight.* Although I do not see that the social sciences are quite so primitive as he concludes in his chapter on Social Inquiry in his *Logic*,¹ I am convinced that the basic argument in his logical theory may well prove to be the most profound contribution of modern times to social science methodology.

The General Issues

As we think systematically we make such distinctions as are necessary for accurate thought. Just precisely what the distinctions are in terms of basic issues depends in part upon the general view-

* Most of the specific investigational issues are stated in terms of the problems of the economics of agriculture, the field of my research program. I have tried to test the ideas presented here against the issues as presented by the most diverse viewpoints in economics; but no doubt the particular turn which my thinking has taken has been influenced most by my graduate teachers who left with me countless suggestions and statements of dilemmas or paradoxes—especially I find myself returning again and again to the remarks of Professors B. H. Hibbard, J. R. Commons, and F. H. Knight. From the formal study of philosophy, I owe a heavy debt to Professors Max Otto and Charner Perry. Among my colleagues, I have benefited greatly by the criticisms and comments over the years by Carl Bogholt, Horace Fries, Erven Long, Walter Morton, James Earley, and Martin Bronfenbrenner. Not the least of the stimulus to this attempt to work through the issues in economic methodology have been the pressing questions of my students. Out of that profound wisdom which doubts all things, students manage somehow to keep one forever in that strange attempt to get his feet on solid ground by thinking about things which are over his head. To the participants in the several Land Tenure Workshops sponsored by the Farm Foundation I am also indebted for countless suggestions.

¹ John Dewey, *Logic, The Theory of Inquiry*, Henry Holt and Company, 1938.

point of the analyst. These viewpoints are to be distinguished from each other on two different bases: (1) what we may call the philosophical frame of reference and (2) the degree of generality attempted in the viewpoint.

As to the first, I accept as a working hypothesis for these analyses the general viewpoint most accurately characterized as instrumentalism. I do this out of a conclusion that here better than anywhere else do I find the basic distinctions relevant to social inquiry as practiced by economists. One of the critical issues here is the question of whether or not mind is a creative factor in the social process. Unless thinking can do more than merely reflect "reality" as a mirror, or observe it as an Olympian spectator, there is no possibility of inquiry being creative. Much of the cynicism of modern economic thought comes from the uncritical incorporation therein of a basic assumption that thinking cannot possibly have any fundamental influence on "reality."

One of our difficulties in economics is that the field is so vast that different people are thinking about different aspects of the whole. If someone sets out to analyze the problems of price predictions, everyone, including the investigator himself, should recognize that what he has to say will be only obliquely relevant to questions of economic organization or control. Again, if we are striving for a statement of the conditions of general equilibrium and achieve this by assuming that the critical questions of valuation are all settled, then we should recognize that we have said nothing about valuation except what we assumed in the first place.

In short, our purposes and problems dictate the required scope of analyses. This might seem to be simple but in the present state of economic thought it is indeed a very difficult matter. Not the least of the difficulties is the fact that economic theory is being taught as a technique of analysis without adequate formulation of the relations to the fundamental issues either in a truly general theory of economics, or of the requirements for investigating genuine social problems. We should not, however, minimize or in any way discredit these techniques of analysis. The problem in this context is rather one of formulating the more comprehensive issues so that we can put economic theory to more fundamental tests than logical consistency.

For these and related reasons I have tried to think my way through the issues by relating them to the basic insights of logical

theory. As we do this we find ourselves drawing careful distinctions between fact and idea; and examining the question of whether economic theory is a system of general ideas, inquiring how economic theory is related to hypotheses in investigation, etc. To make and discuss such distinctions we must have some common understanding of the nature of propositions and their relation to judgment; of induction-deduction; of definitions and classification; of the theory of predication; and other elements of logical analysis.

One of the most difficult tasks in all this, at least for one whose primary training is in economics, is to keep clearly in focus the logical nature of the distinctions.

Kinds of Scientific Generalizations: General Propositions

We begin the exposition by accepting the conception that there are two distinct kinds of scientific generalizations: the abstract and the factual.² The validity of this conception will be argued subsequently. Abstract generalizations are technically known as Universal Hypothetical Propositions; generalizations of fact are known in logical theory as Generic Propositions.³ Abstract universal propositions formulate the basic argument of scientific theory, including economic theory. The generic generals state the generalized facts, the established facts, in propositional form. As will be developed in more detail in subsequent sections of this paper, scientific generalizations from investigations of fact can be achieved only by the use of the hypothetical universals. This requires some examination of the actual processes of generalization—of the relation between induction and deduction. Also it will be argued, that the content of hypothetical universals is given by the nature of the problem under investigation.

A proposition is distinguished from a mere social communication by the function it performs rather than by the form. A proposition is an assertion which is grounded in argument and evidence; it is a statement which is a part of a set or series of statements each of which is framed with reference to resolving a question, by pointing

² Dewey, *Logic*, especially Chaps. XIV and XV, pp. 264-310.

³ Readers will recognize the difference between accepting this distinction here for purposes of simple statement of the argument and acceptance of the same as a valid hypothesis for the explanation of scientific theory. The latter is of course the fundamental question. I shall attempt to present the main points of the basic argument for the validity of this distinction—but a complete analysis of the issues would require that we cover the whole field of logical theory. Such is manifestly impossible in this essay.

toward some "cumulative convergence in effecting final judgment." A logically complete proposition indicates its own grounds for validity.⁴

The reasoning back of this assertion that there are two fundamentally different kinds of scientific generalizations will become evident as the argument develops. But I do not want to gloss over the fact that this is a genuine issue. For example, once this distinction is granted the oft repeated claim that a theory is warranted because the assumptions upon which it rests "fit the facts" must be re-examined. Also, new light is shed upon Professor Knight's perennial insistence that great confusion is injected into economic analysis by the erroneous belief that economic theory describes existence.

Professor Frazer maintains that there are not two different sets of propositions, but that two different aspects of the same propositions should be distinguished.⁵ Mr. Hutchison, however, holds that economic theory is so completely separated from generalization of fact that pure theory is simply "verbal"—a set of seemingly independent propositions.⁶

I cite these different interpretations merely for the purpose of indicating the order of issues involved in the acceptance of a position regarding the kinds of propositions. But the issues cannot be argued out now. Here I simply observe that in the argument of this paper, economic theory is considered as falling within the realm of universal hypothetical propositions. Such propositions do not describe the facts; rather the function of these propositions is to "prescribe" the conditions which must be met in classifications of fact. As such, economic theory is an elaboration of definitions, but

⁴ See Dewey, *Logic*, p. 321. Also: "When it is said that 'iron is a metal' the proposition does not appear rational because we cannot convert it simply into 'metal is iron' But the proposition as it stands is not logically a complete proposition. It does not indicate or even suggest its own grounds. At most it is either a sentence communicating information or is a proposition preliminary to further inquiries. The complete proposition is 'Iron is a metal possessed of such-and-such differential characteristics.' Any metal having these specified properties is iron, so that the proposition is logically, not verbally, a proposition regarding a *relation* of kinds" p 308-309

⁵ *Economic Thought and Language*, L. M. Frazer, A. & C. Black, Ltd. London 1937, p. 52.

⁶ *The Significance and Basic Postulates of Economic Theory*, Hutchison, T. W. Macmillan, London, 1938. In critical discussion of the issues involved in this positivistic conception of theory and methodology see Professor Knight's review, "What Is the Truth in Economics?" *Journal of Political Economy*, Vol. 48, 1940, p. 1; and the reply and rejoinder in same *Journal*, Vol. 49, pp. 732ff., Oct. 1941

the definitions are not arbitrary or to be selected at the pleasure of the theorizer. Rather the definitions and theories are elaborated from insights derived from actual existential relations. The solution accepted in this paper is that the two different kinds of generalizations are distinguished by analyzing the function which they perform in inquiry.

There is a fundamental difference also in the way in which propositions within the two types are related to each other. Hypothetical universal propositions come in series; each proposition follows from the preceding. They are related by logical necessity, and may be proved or disproved by logical analysis. Generical generals and other propositions about existences are developed in sets. As the propositions of fact are developed they gradually converge upon the point in question. In the latter, "proof" can never exceed some degree of probability.

Warrantable Statements of Fact

We may go right to the heart of the matter by asking the general question, how does one establish a statement of fact? This question has been answered in different ways; and this variety of answers can be found all through economic literature.

Those who would simply collect observations of particular instances and then generalize from this collection, accept the conception of a fact as given in and of itself ready to be picked—so to speak. So considered, facts are simply data (literally the given). If you follow out the argument of this approach, you come eventually to the conclusion that the basic classifications of fact are (a) either given in nature (the Aristotelian view) or (b) in some form of sensational empiricism such as that the basis of classification is simply in the regularity of the repetition of impressions of the observer. In either case the facts can be known without discriminating thought.

It should not take very much argument to convince any investigator of the fundamental error of the above conception. Facts are not *given*; they are *taken*—taken by a process of selective discrimination. Facts do not just happen, but happenings can be converted into facts. Only "things" just happen. In common speech we more frequently use the negative—as "nothing happened." But stated either way the "given" nature of happenings is suggested. When we attempt to understand "what happens" we use thought to dis-

criminate "happenings" into "events." Again common speech notes this distinction by referring to happenings as "minor events" or "big events" and so on. Inquiry (research) discriminates happenings into events and these are "taken" to be facts, although we frequently *mis*-take something to be a fact which isn't. Events are converted into facts when we understand the relations between them, the conditions upon which their occurrence depends.⁷ Facts are questions answered by inquiry into events. The genius of finding facts is largely knowing what questions to ask.

Fact finding is more than observing what happens. To anticipate subsequent argument, facts are derived by judgment; and judgment is the core of the method of generalization. Regardless of the degrees of refinement in procedure, of sampling or otherwise, ultimately the events are "judged" to be facts. This appears to hold whether we consider few events as on one farm, or a mass of events as in the making of a crop estimate.

It turns out, therefore, that the validity of the facts themselves turns on the methods of generalization. The view adopted and developed here is that particular observations are developed into facts through a process of comparison-contrast guided by a system of definitions—which definitions are a part of the comprehensive system of abstract conceptions.

The Methods of Generalization

(1) The general pattern of inquiry; problem formation and solution.

In any research effort worthy of the name, the attention of the research worker comes to a definite specified focus. We do not just research in general. We investigate something. How that something is chosen is not crucial provided only that the problem is real, not fanciful. In the practice of the advanced sciences, many, if not most, of the research problems are set by discrepancies between observed occurrences and previously accepted explanations. But

⁷ In Dewey's statement: Facts "are selected and described . . . for a purpose, namely statement of the problem involved in such a way that its material both indicates a meaning relevant to resolution of the difficulty and serves to test its worth and validity," *Logic*, p. 113. Or in more general terms: "The objects of science . . . are an order of relations which serve as tools to effect immediate havings and beings"—John Dewey, *Experience and Nature*, Open Court Pub. Co. 1929, p. 136. Again: "Knowledge . . . signifies events so discriminately penetrated by thought that mind is literally at home in them." *Ibid.*, p. 161.

many of the problems studied by agricultural economists, at the state Experiment Stations at least, have been those posed in the first instance as immediately practical problems of farmers. For purpose of exposition here we shall direct our thinking to the formulation of a procedure in terms of analysis of an immediately given problem at the farm level. But however theoretical or immediately existential the problem, the ultimate test of a valid solution must be the final explanation resolving the doubt, or answer to the question. This is checked by acting upon the conclusion; the final test for all sciences short of (in terms of abstractness), or other than, pure mathematics is practical relevance.

(a) *The situation; confused—problematic.* Perhaps everyone who has worked in a state Experiment Station has had the experience of being confronted with an assignment something like this: "Something is going wrong out at Silver Creek," or "The farmers can't get any help," or "Their farms are being foreclosed," or "The livestock are coming to market in bad shape," or "The cooperative is about to go bankrupt," or "What was once an active rural community is now dead," etc. The details are infinitely varied, but the common import is a situation of confusion, doubt, tension.

The first thing to get clear is whether or not the confusion is in the situation. If it is, this gives an objective base upon which to work. From this situation a problem is gradually defined. But there is a vast difference between a confused situation and a problem. What intervenes is the first stage of analysis—defining a problem. A problem is essentially that aspect of the situation which if modified will correct the difficulty. In short, the problem is the limiting factor in the reconstruction of a situation. The solution of a problem must be conceived of as in some way related to the potentialities of the situation—the accessible or available alternatives. But the situation is not all confusion, otherwise investigation could scarcely be fruitful. The problem has to be set off against the stable parts of the situation which can be taken as reliable or dependable.

There are two closely related but separable issues in the conception of a problem. The *nature* of a problem and the logical function of problem solving. It is important that we conceive of the nature of a problem in some way which actually *admits* of solution. It is very common practice for economists to attempt to treat "problems" as the discrepancy between the actual situation and some

"ideal" assumed to be the relevant solution.⁸ Under this conception of a problem the "solution" is simply a priori and arbitrary without regard to available alternatives in the situation.

In the context of the present argument, however, the role of problem solving as a method of verification is the more critical consideration. The crux of the issue is simply this: that the only alternative which we have to the validation of inquiry by problem solving is a reliance either upon the self evidence of fact or principle as the foundations of knowledge—or upon revelation. Both of the latter alternatives are incompatible with a genuinely scientific viewpoint. It is the recognition of this point, I infer, which leads almost everyone to talk about problems and problem solving, regardless of viewpoint or of the way genuine problem solving fits into their implicit theory of knowledge.

But if one is to conceive of problem formation and solution as a fundamental part of inquiry the actual procedures of investigating a problem need to be conceptualized. To return to the instance of investigating an immediate problem, when the investigator is handed the assignment he likely looks first for analogies.⁹ Gradually he begins to assemble some possibly relevant facts already known; number of farms, or kinds of livestock, or the history of a school or a church, etc., depending on the situation being analyzed. Correlatively he takes a provisional inventory of explanations previously given and generally accepted; then if he is wise he will pick up unaccepted, even seemingly foolish, suggestions. The known facts are the raw materials of the "facts of the case" and correlatively the explanations are the beginnings of the hypotheses to be formulated as a solution to the problem. So far all this is general and preparatory; the facts and suggestions are provisional—provisions for the explorations, in the literal sense of the term provision. If similar problems have been investigated before, and the procedure is well established, the investigator will have available a large body of facts, presumably relevant, and a comprehensive

⁸ See for example Gale Johnson's "Contribution of Price Policy to the Income and Resource Problems in Agriculture," this Journal, Vol. XXVI, No. 4, November 1944, p. 631ff.

⁹ This is one place for the method of analogy—sometimes treated as a separate method. For example, "Research Method and Procedure in Agricultural Economics," Social Science Research Council, 1928, pp. 15 and 298. The position taken here implies that the use of analogy is simply a distinguishable phase in a continuous process of research. This is essentially what the authors of "Research Method" also intended.

body of theory which will serve as the matrix for the hypothesis for this particular investigation.

But the actual inspection of the situation is something different. Here one sees at first, say, farms of different sizes and qualities, occupied by persons of varied ages and capacities, etc.—in short, a cluster of unique events. The first stage of the actual exploration or inspection is to note the “qualities” of things. You talk to first one person and then another—just visiting but thinking all the while. You visit some more and “compare notes.” The notes you compare are simple assertions, each one rooted in an observation. Assertions of this order are simply statements regarding observed qualities but they don’t “make sense” as we say. In terms of logic the assertions are “particular propositions.” They may be interesting but they are scarcely instructive.

So far we have noted only qualities. The observations of qualities make sense only when qualities are taken as the “traits” of something. The observed qualities become evidence, as evidential traits. Or as we say quite accurately in common speech, “I saw this but what does it mean?” When qualities become the signs of something, they take on significance.

Here is the root of the necessity for hypotheses, theories, systematically formulated concepts. For a quality to become a trait, or a sign, it must be related to some systematic system of concepts.

In exploring the situation further, the investigator may suddenly “get an idea.” He sees a possible connection between “particular” assertions. This connection when analyzed is stated as a conception; subsequently, if the analysis prospers, the conception directs further comparisons and contrasts and the situation begins to clear up. In systematic inquiry the hypotheses guiding a particular investigation are elaborations of suggestions rooted in some “growing point” in a comprehensive system of theory. The “meaning” of the facts in this problem then merges, through discourse, with the general system of guiding theory.

In terms of logical theory, the particular propositions are converted into “singular” propositions about connections among things. These singulars when classified into a comprehensive generalization take their place as members of a kind, and are then comprehended by a more general proposition—the generic general. The farm machinery rusting out-of-doors becomes a sign of a neglectful farmer; which in turn is one of a larger class of farmers

who are likely to have high costs in relation to returns, or permit their farms to erode, or their livestock to become diseased, or their children to become truants. What the quality becomes a sign of depends in general on the purpose and context of the investigation, and in terms of procedure, upon the hypotheses that are then operative in inquiry.

The hypotheses formulate the alternative possible solutions to the problem and are tried, reshaped, rejected or then finally accepted as the best explanation possible (under the circumstances).

In terms of a problem, the problem is not clearly formulated until the possible solutions are systematically stated. The problem is resolved by testing the several hypotheses, as possible explanations when used in conjunction with the facts—both the facts of the case brought into the analysis from previous studies and the facts produced in this specific inquiry under the guidance of the very hypotheses for which the facts are evidence.

It is much easier to see from our experience how the formulation of a problem suggests the solution than it is to comprehend the deeper insight that a problem is not formulated until a solution is projected. Instances abound from the work of agricultural economists to illustrate how the formulation suggests a subsequent solution. It was in the early 'twenties, I believe, that the index of the prices of things farmers sell and the index of the prices of things farmers buy were published in parallel fashion in the *Agricultural Situation*. On the surface this appears to be within the conception of Say's law that goods exchange for goods. But this publication undoubtedly gave great impetus to the practical solution which set out to achieve "parity" prices for farm products. Similarly, Professor Knight's formulation of "uncertainty," which was devised as a part of a rigorous statement of the theory of distribution, when taken to represent a "problem" in agriculture leads directly to the solution of "forward pricing" as a method of solving the problem of uncertainty in resource use.

Clearly, then, the formulation of a problem is a gradual process—in which events are converted into relevant facts, and facts are taken, or discarded, as evidence. This requires a continuous shifting back and forth from clearer evidence to refinement of hypothesis.

(b) *The logical function of schedules.* Somewhere in this process of

investigating a situation, if a field survey is to be made a field schedule has to be drawn up. A real schedule differs from a mere listing of observations simply in this: that in the schedules qualities observed are treated as traits of something. And they are traits only in so far as the problem has been thought through. It is therefore not surprising that rarely, if ever, is a schedule found to be completely adequate. This also indicates why some of the most revealing observations in a study may be those written in the margins or on the back of the schedule. They are notations of qualities which are found upon further analysis to indicate significant traits. The reason may be equally evident for the crippling or blinding effect of stereotyped questions on a schedule imported from previous studies. Questions on schedules, to be effective, need to be components of a system of concepts which have been thought together with specific reference to the problem at hand.

(2) *Induction and deduction.*

It is a commonplace that induction and deduction are both necessary in systematic inquiry. But what is meant by the two operations, independently and conjunctively, is less frequently explained. Although the two processes are so mutually involved as to make inquiry impossible without both, the inductive function will be examined first.

It is generally agreed that induction is the process by which generalizations are arrived at. The significant questions turn on *how* this is done. In the viewpoint incorporated in this paper,¹⁰ the critical point in induction is the transformation of a particular into a singular. The active process of generalization centers here and amounts to the construction of a singular from a particular.

An illustration may help make this point more understandable. A farmer is operating a relatively small place, yet seems to be making a good income without extraordinary effort. As an instance he is unique—in common speech we say, “he is in a class by himself.” This of course is logically equivalent to saying that he isn’t in a “class” at all. But a farm management survey will classify him. How? If meaningfully, it seems to me, the researcher will seek out the connection between the many elements in the farm in such a way that he has some idea of how this same set of “attributes” can

¹⁰ See Dewey, *Logic*, Chap. XXI, Induction and Deduction, especially pp. 248–252.

be reconstructed. The investigator will have ideas of the way things are involved together on this farm so that he can direct the way in which other farmers may be able to do likewise. When the analysis has proceeded as far, then this original unique farm combination, this cluster of events, becomes the ground of the construction of a *singular* case which is one of a kind (shall we say efficient, high-labor-income small farmers). But the point is that generalization from this particular case is based upon the possibility of reconstructing the essential relationships for a singular. Consequently the generalization is possible only through the instrumentalities of the hypotheses which directed the analysis, by formulating the "possibilities" by which the "potentialities" of the involvements were analyzed.

The inductive process, then, moves from particulars to generals by the formation of classes, through controlled institution of singulars (to use the logical terminology). But classifications are worked out only with definitions; here the cooperative, or complementary, nature of induction-deduction is clearly evident.

Deduction is a chain argument. In deductive thought there is the development of implications through a series of statements, each of which is related to the other in a logically necessary way. Grant the initial proposition and you are forced to accept the others, simply because all are implicit in the first.

The function of deduction in the process of generalization is to develop the implications of certain relations. More specifically a chain of reasoning develops a series of propositions, a theory; this theory is an inclusive set of definitions used in the investigation. These definitions work out in rigorous fashion the interrelation of characters. For example, in "a perfect market . . . all the buyers and sellers in it have perfect knowledge of demand, supply, and prices and act rationally upon that knowledge."¹¹ These characters of a perfect market are so interrelated that all must be embraced within one general conception. Each is implied in the other. The binding together by implicatory reasoning of such concepts as the market, supply, and consumption into a logically consistent system is economic theory. The deductive function in generalization elaborates an appropriate possible set of definitions, which set is gradually whittled down by trial—gradually reduced to the one best definition for the investigation of that time and place.

¹¹ Shepherd, Geoffrey S., *Agricultural Price Analysis*. Collegiate Press, 1941, p. 31.

(a) *Classifications—definitions.* Classifications of relations into mutually exclusive classes are possible only on the basis of complete definitions. The aim of an exhaustive classification, on a given relation, or set of relations, is to classify the (existential) events into mutually exclusive classes—with all of the cases included; the classes total 100% of the universe. Essentially these classes are additive. But such inclusive-exclusive classes, based on characteristics, can be formed only on the basis of definitions in which the relevant characters are worked together by discourse in such a way that the essential interlockings are clearly defined. The definition or system of definitions points to a conjunction of traits. If the particular instance fails to qualify on *all* of the specified traits it is not placed in this class. The *characteristics* are classified according to the way the *characters* are related in the definition.

(3) *Generalization through judgment.*

Scientific inquiry has for its purpose the increase of knowledge or enlargement of the domain of fact. Upon this there is general agreement. But one crucial feature of this process has not been generally recognized by economists, I believe; namely, that the actual finding of fact involves a judgment, which judgment has parts which can be analyzed according to their function. One of the central theses of this paper is that this judgment function needs to be analyzed as a part of the methodology of economics.

In "pure" economic theory there are no judgments, just an interminable series of propositions, a system of implicatory relations. At this limit of "purity," however, economic theory becomes one with mathematics. Since economic theory must have some "economic" content (to be discussed later), we find that theorizing in economics always takes a direction according to the purpose of the investigation. The "purpose," in terms of methodology, is actualized through judgment.

The kernel of the idea is simply this: that all judgments when cast in the form of a syllogism have a theoretical major premise and a factual minor premise.¹² Functionally, then, theory operates through judgment as the major premise; it is here that theory is tested—when tried in the crucible of judgment.

¹² See *Logic*, for example, Chap. VII, and Chap. XIII. The exposition here follows the general conception by Dewey but is stated rather loosely to convey the general idea without careful attention to the nice distinctions of technical logical analysis.

I have used the term judgment and the syllogism as synonymous: this requires some explanation.¹³ Technically speaking the judgment takes the form of subject and predicate. Through judgment we predicate something of the subject. The subject is a factual something—which marks off some part, some potential, of a situation; the predicate is an idea which states (implicitly) some plan of action for realizing possibilities. The statement of ideas (theory) elaborates the possibilities of action; the assertions of fact state the potentialities of a situation. A judgment brings the possible and the potential into consonance through narrowing down the range of the possible to that which can be conjoined with the available potential.

It is therefore through the "predication" process that the area of knowledge is expanded. A subject whose known *potential* has been expanded by fusion with a wider range of the *possible* actually increases in potentiality. It follows too that it is only through the use of theory that the actual field of knowledge is expanded. We whittle away at the unknown first through exploring the possibilities through speculative reasoning and then occupy the territory through enlarging the known potential by the expansion of the coverage of existential propositions—statements of fact.¹⁴

The subject of a judgment is not just any statement of fact. Out of the total situation those facts are selected which are relevant to the problem at hand. Similarly propositions of theory are not moved like counters into the predicate function. Instead the major conception which gives most promise of being relevant as an "explanation" or "solution" is taken as the initial point of the chain of discourse. "Does the elasticity of demand have any bearing on the possibilities of production control?" Or, "Does the willingness with which people join organized activity influence the functioning of an organization?" From such general conceptions as "elasticity of demand" or "willing participation" the investigator elaborates a series of propositions toward the relevant problem. This is, of course, an extremely difficult task.

¹³ "The syllogism is the form of the conjugate connection of the factual and conceptual subject-matters of judgment, stated in such a way as to indicate the conceptual and observational conditions to be fulfilled if judgment is to be adequately grounded. Interpreted in this way, the 'utility' of the syllogistic form resides in the fact that it serves as a check in the case of specific judgments, holding up the logical conditions to be satisfied." Dewey, *Logic*, p. 327.

¹⁴ In these remarks I am limiting the illustrative reference to scientific judgments; formally all judgments are similar but I defer comment on practical judgments until later.

Technically, it may be that all that is required is the elaboration of concepts into a complete idea—complete enough to “explain” the problem. An idea is not just a word, or a copy of some “thing” as Locke thought. An idea is a plan of action. “Ideas are anticipated consequences (forecasts) of what will happen when certain operations are executed under and with respect to observed conditions.”¹⁵ Therefore the conception is not really an idea until it is elaborated into a procedural means.

Through the continual testing and trying, by sifting the factual evidence to find the relevant, by arguing back and forth through a system of conceptions, the factual and the ideal, the subject and the predicate are brought into correspondence with each other. “There must be some one *question* to which both the subject ‘this’ and the predicate are relevant.”¹⁶

Generalization, then, is not grounded in the nature of things, but in mode of response to the investigator. Professor Dewey stated the essence of the problem of generalization in a powerfully simple way. “We are brought to the conclusion that it is the modes of *active response* which are the ground of generality of logical form, not the existential immediate qualities of that which is responded to.”¹⁷

Thus far, we have attempted to work through the theory of scientific inference and generalization in economics by analyzing the nature and function of propositions and judgments. It is now proposed in the remainder of the essay to carry the argument into the consideration of three fundamental issues in economic research: the nature and function of economic theory in inquiry; the distinction between pure and applied economics; and the problem of classification in statistical analysis. Obviously each of these vast topics must be treated with utmost brevity; however, it may be possible to indicate briefly the way in which the basic issues are related to the theory of inquiry under consideration.

The Logical Function and Status of Economic Theory

Everyone seems to agree that economic theory is a logically consistent body of propositions. Theory is expanded or developed by rigorous attention to implication. The implications of rigorously

¹⁵ Dewey, *Logic*, p. 109.

¹⁶ Dewey, *Logic*, p. 126.

¹⁷ Dewey, *Logic*, p. 252

formulated insights are elaborated into a system of conceptions by deductive reasoning. Furthermore, theory is developed in blocks which may be integrated into a unified body of argument by developing common major premises from which the various propositions are deducible as implications. The fundamental major premises are postulates, which are chosen on the basis of adequacy of function in giving unity, power and direction to the theory.

It is also quite generally agreed that no one can be a really top-flight economist without having thoroughly mastered the theory which is relevant to his field of work. But when one inquires just what relevance means, he will find much less agreement. Indeed one can scarcely maintain that there is any substantial agreement on the fundamental reasons of *why* and *how* economic theory is relevant to either research or practical action. I do not propose to make any survey or evaluation of the reasons given or acted upon by economists in this context. Instead, I shall attempt to state the argument for the logical function of economic theory within the general conception of inquiry hypothesized in this essay.

It seems clear that economic theory has its primary function in assisting economists to think clearly and accurately; i.e. the basic function of theory is methodological. This is explained, according to the general hypothesis of this paper, by the double fact that (1) economic theory provides the major premise, the ideal content, of scientific economic judgments, and (2) theory is the method of exploring possibilities (the logical function of predication).

Within this logical conception, economic theory is recognized as being a body of abstract propositions, propositions which function in inquiry as abstract universals in judgment; that is, as providing the categories which determine what factual material can serve as evidence in inquiry.

It will be recognized that economic theory in this sense is not equivalent to general economics. General economics contains different kinds of generalizations which have differing relations to inquiry. Furthermore, when one examines the question of "pure vs. applied" economics, as we do in the following section, it becomes clear that a proposition may function, in identical word form, either as an idea or as a fact depending upon the context and purpose of judgment. However, there are very cogent arguments for the position that only by the analysis of the logical function and status of economic theory can one clear up the current confusion about theory.

It seems clear, on logical grounds, that economic theory does not describe facts or "reality." Theory is a necessary part of the method of describing or classifying facts but it functions as a system of definitions which provides the logical foundation for classification. Theory *prescribes* what is relevant rather than *describes* what is present. The hard facts of the matter are that since the time of Darwin, natural categories are intellectually inadmissible; Darwin pulled the stakes for all humanity and we must henceforth recognize that the world is a process without fixed entities and natural classes. It follows therefore that the only way in which reliable classes can be formed is through the systems of theoretical reasoning by which the categories of thought serve as the bridge between our purposes and the universe as experienced. In this way the classified facts function as evidence. It follows also that one's system of economic ideas determines what is economics to a person, through the selection of evidence. As Boulding has remarked, "The first task of economic analysis . . . is to select from economic events and facts those elements which are significant in relation to the general scheme of economic analysis itself."¹³

In a general way, then, economic theory is simply the system of ideas which economists have derived as a part of the efforts to understand the economic problems of mankind. The content of the system of ideas varies therefore according to what economists consider to be the economic problem: the production of wealth, the business of life, the making of a living or getting rich, the maximization of the utilization of scarce means, etc. But the common ground of all these interpretations (and despite their differences they have much in common) is what we may call the "meaning" of the economy to economists. The general definition of economic theory, therefore, would seem to be about this: "Economic theory is a carefully reasoned statement of the meaning to economists of (that part of) the economic system investigated."

The conception of economic theory as a specialized system of meanings permits the placing of the theoretical concepts of economics in the more comprehensive system of meanings. The meanings of economic efficiency, private enterprise, individual initiative, and collective economic action are surely an integral part of some conceivable comprehensive system of meanings of the American way of life, for example. Similarly, the conceptions of efficient pro-

¹³ Kenneth Boulding, *Economic Analysis*. New York, Harpers, 1941, p. 6.

duction, private property and economic freedom, for example, are an integral part of some conceivable system of meanings by which an independent farmer guides his career.

I do not see that economists have much choice in the matter of how theory functions in thought. If one is to think accurately and scientifically about any point, one must have the control that can come only from an elaborated system of guiding conceptions. If one doesn't acquire these systematically he just "picks them up about the place," as we say in common speech.

*Pure and Applied Economics: Or Scientific and Practical
Judgments*

We turn now to a cluster of issues in economics which are so involved and difficult that any frank discussion of them must be experimental. But the need is urgent and we shall hazard a few comments in the hope that the implications of the previous argument may yield some insight here. Not the least of the difficulties in dealing with "applied economics" or "practical judgments" in economic affairs is that basic issues of valuation are ineradicably involved herein.

I am driven to the conclusion that the distinction between "pure and applied" economics, like that between "pure and applied" science generally, must be abandoned as a general principle. The distinctions made are usually important, but at bottom they confuse the issues.

To accept the distinction between "pure" and "applied" economics as generally valid and fundamental is not only to accept the view that "theory" in its pure form can have an independent career but that it can be validated in some way other than by "application." Furthermore, to accept this distinction as fundamentally valid is to accept the view that the "application" of theory can actually define or demarcate the real practical problems and serve as the source for practical wisdom. To recur to the argument of the earlier part of this essay, the only alternative to some sort of "practical" test of validity in inquiry is the resort to "self-evidence" or revelation.

I do not see how anyone can deny even for physical science research, that the overruling purposes which give the general direction to investigation are rooted in the general needs or problems of the society which supports (or even permits) these inquiries. This

is more obviously true for social science inquiries since the evaluation issues are so much more intrinsic to inquiry itself.

Yet there are fundamental differences here which need to be honored. An alternative formulation, and one which is believed to be consistent with the general thesis of this essay, is to distinguish scientific from practical judgments. Here the distinction turns on content rather than method.

Scientific inquiry has for its purpose the discovery of fact; by rigorous methods of inquiry we gradually discover the underlying connections of things upon which occurrences are dependent. Furthermore, scientific procedures are designed so as to be a part of a continuum of inquiry. A crucial part of this method is the recurrent and repeated formulation of judgments. Scientists hazard judgments for example, that a specific vitamin affects the functioning of an organism in a specified way; or that the savings function operates in some specified way in capital formation; or that diversification of enterprises will increase labor income. Are the judgments correct, or correct enough to be acted upon with reasonable safety? Well, we have to see "how things work out" when we act upon the assumption that they are correct.

There is a vast difference between these scientific inquiries and the practical judgments found in such diverse acts as everyday choices of living or the grand strategy of public policy. These practical judgments have as their purpose the use and enjoyment of things. They are concerned with the way the potentialities of existence are made to serve mankind.

I doubt whether there is another issue of equally grave importance confronting agricultural economists in America, as the distinction between scientific and practical inquiry. Let no one doubt that fundamental scientific inquiry into the economic problems of agriculture is the foremost task of agricultural economists. However, the problem-solving approach to inquiry, which is built into the very structure of agricultural colleges, easily and naturally frays out into a mere servicing of practical judgments. In fact, it requires strenuous intellectual effort to avoid this very outcome. Under such circumstances we gradually drift into an acceptance of the "problems" as formulated by our consistency. The next step is simply that of making "investigators" the mere tools of various interests. All this may be a very pleasant and even an exhilarating experience for awhile, but from a professional viewpoint

it leads to the "consumption of our seed corn" if we may use a good homely phrase.

Yet the issue must be faced. The argument seems inexorable, that there is no other alternative in genuinely scientific inquiry to having both the roots of inquiry and the final tests of validity in practical problem solving. The argument seems to lead us to this point: that the validity of scientific judgments is ultimately established through the "improvement" which such judgments can make in practical judgments. This follows from the admission (1) that the judgments are the critical acts in the utilization of scientific findings; and (2) that the ultimate validity of scientific findings is to be established by practical use.¹⁹

The acceptance of such a viewpoint leads to some novel and difficult problems in economic analysis. Among agricultural economists, or any other group of economists who have a field of specialization, (which includes virtually every one of them) distinctions between scientific and practical are made as a matter of daily work. But there is a strong probability, I conclude, that our efforts are being frustrated and our work reduced in quality because we are intellectually confused on these basic issues of pure or applied; or scientific or practical.

As a suggestion on how we might resolve the issues, we should recognize, first, I believe, that practical judgments have essentially the same form as scientific judgments; namely, that the major premise is theoretical or ideal, the minor premise factual. The facts of a practical judgment, when put in propositional form, are statements of the way things are involved together in the opportunities and obstacles which are relevant to the course of action proposed.

The generalized formulation of these facts, of the way existences are involved together, is the task of scientific inquiry. The facts established by genuinely scientific inquiry are also the general facts of the case for a practical judgment in a specific situation.

¹⁹ The statement of the argument of this section of the essay is made in terms of the relation between scientific and practical judgments in order to bring into sharp focus the operational character of, and fundamental similarities between, all kinds of inquiry. It is implicit in the argument, however, that scientific and practical judgments are related to each other through the reciprocal utilization of the products of each. Scientific judgments produce generalizations; these generalizations are the general and basic ingredients of practical judgments, but reciprocally the validity of the propositional generalizations of scientific judgments is tested by the effectiveness with which they can be used to improve practical judgments—which judgments are directed to the development, use and enjoyment of resources.

A more particular investigation can discover the facts peculiar to the particular practical judgment.

The unsolved or neglected problem in this area of economic analysis is the investigation of the ideal content, the theoretical principle, which forms the major premise of practical judgments.²⁰ Surely the ideas which guide conduct in practical economic affairs and policy can be the subject of investigation. And their discovery and formulation are both an essential part of economic investigation and the bridge, as I see it, between scientific and practical judgments in economics. To be sure there is the question of to what extent practical judgments, including policy decisions, are economic in focus and content. But even this point seems covered by the present proposal: if the problem embraces many different aspects, then both the relevant ideas and facts will be diverse and complex. The ideas will have to be integrated and the sets of facts carefully coordinated to provide a basis for dependable judgment and action. But the contribution of economic analysis to the judgments is still of two sorts: (1) the ideas, philosophies or principles which operate in the major premises of judgment (or the predication of reliable possibilities) and (2) the economic facts which form a part of the minor premise (or subject) of judgment.

It may be obvious that such a possible treatment of principles, or ideas as major premises, faces the valuation problem in two different ways: (1) by formulating the ideas which guide action we open up the possibility of allowing for a plurality of values; and (2) it suggests that ideas as plans of action are the genuine objects of valuation.

Viewing the whole matter in logical terms, then, we seem to have three different kinds of generalizations in economics, even though on logical grounds there are but two kinds:

- (1) the generalizations of economic theory
- (2) the principles of conduct in economic affairs
- (3) the generalizations of economic fact.

In terms of logic, the generalizations of economic theory always appear to function in economic inquiry as abstract hypothetical universal propositions. The generalizations of the facts about the way

²⁰ It is the systematic formulation of the ideas which guide practical action which I understand Allin to mean by *practical theory*, in his stimulating essay, "Theory, Definition and Purpose," in the August 1949 number of this Journal.

existences are involved together are generic propositions.²¹ The generalizations of principles of conduct are investigated (and investigatable) as facts in scientific inquiry but function as abstract propositions in practical judgment.

Unless I am badly mistaken the ideas as plans of action or principles of conduct have not been investigated and cannot be investigated under guidance of equilibrium economics. Formally the issues are met in the purely theoretical formulation by assuming rationality of economic behavior and efficiency as the sole value. Practically under this conception of economics we damn people for being so foolish as to be irrational and say in effect that if genuine valuations can be investigated, at least it is beyond our field.

Any investigation which is guided by rigorous adherence to a mechanical equilibrium theory will, as a matter of course, find only quantitative facts. The "quantities" will be facts of course, but they will be facts which for the most part when related to action will describe or measure the obstacles to action, the resistances to be overcome; the material to be handled, etc. In our careful statements on matters of policy or action we speak about the "effects" of policies, institutions, and activities upon the described system of prices and production. No one who has given any thought to the matter would deny that these are facts of inestimable value. But the actual courses of action are beyond the pale of such investigations.

The suggestion of this essay is that if we are actually to implement and improve practical judgments the ideas at work in such judgments must also be investigated. Nor is this a wholly novel suggestion. Agricultural economists, for example, have had much experience in such investigations. There is, I believe, a great opportunity to improve these investigations; and on the negative

²¹ In terms of content, the range of generalizations of fact would depend upon one's conception of economics. As I read the record, the generalizations of economic fact which have been produced under the guidance of modern equilibrium theory, have come to be considered almost exclusively as facts about the operation of the economy. This seems to me to impose a most unfortunate limitation upon systematic economic analysis in an age when the whole fabric of the social and economic organization of the world is being transformed by negotiation, diplomacy, revolution, taxation and public spending. The generalizations of economic fact, then, need to be viewed as including generalizations about the economy as an organization of human relationships as well as generalizations about the input-output, cash income and price relations, etc. in the operation of the economy. Nevertheless the logical status of such generalizations would be identical, namely generic generalizations about the way actual existences are involved together.

side, the pressure of "modern" theory has tended to rule such investigations out of scientific work.

The raw materials for investigating conduct are everywhere about us wherever people act volitionally. In farm management this means the analysis of "practices"—where practices are what people do regularly in operating farms. It is the practices, as acts, that put a concern together and keep it together. The principles of conduct are simply the "meanings" of these practices generalized into some "ideal" of practice.²² Similarly in all sorts of collective action, the working rules of the organization are the "ideals" derived from the critical analysis of practices. In such cases the "rules" are the principles of joint conduct, which are at once rules for settling disputes and an expression of the purposes of the organization. If one analyzes "conduct" in public policy for the purpose of discovering principles, he would likewise study the practices of statesmen, politicians, administrators, etc. The common ground of all these "principles" is evidently the conception of ideas at work, with ideas conceived of as plans of action taking into account the accessible alternatives among the opportunities and obstacles of such situations.

Here also is the crux of the value problem in economic behavior. Evaluation is inescapably a function of practical judgment. And it is evidently in the guiding ideas in such judgments that the principles of value are explicitly formulated. That is to say, generally speaking, the analysis of valuation must center on conduct and not on values as discrete things. In individual conduct we evidently should appraise alternative ways of doing and living in terms of the consequences for general well being of the individual. In social affairs the analysis of valuation would center upon the rules by which persons work, live, and play together. These rules would be appraised in terms of the effectiveness with which they promoted, say, peaceful, orderly and creative living, and efficient production.

²² I do not want to suggest that the derivation of these meanings is altogether a simple affair. In my own experience I have found any such effort to be both difficult and baffling. In our study, *Keeping the Farm in the Family*, Parsons and Waples, Wis Exp Sta Res Bul. 157, 1945, we attempted to analyze meanings as guiding principles in transference of farms from one generation to the next. At about the same time John F. Timmons working on a study of inheritance in his Ph.D. dissertation formulated the strategic relationships in the devolution of property as "purpose-practice-consequence." He was attempting to formulate something like principles of conduct in the general field of inheritance. See John F. Timmons, *Social and Economic Aspects of the Devolution of Agricultural Land Through Descent, Will, and Gift (A Study of Agricultural Land Inheritance)*, Library, University of Wisconsin, 1945.

But methodologically the point is that these principles would be analyzed scientifically as principles of conduct, and acted upon practically as the major premises of judgment of conduct.

Such interrelations of scientific and practical judgments as indicated raise many questions about the function of economists in practical affairs. It is doubtful whether we are far enough advanced in our scientific work to warrant a complete separation of function. Perhaps economic affairs may always be so complicated that the truly scientific investigator must also assume intermittently the responsibilities of practical administration and judgments. At any rate every investigator in economics even to be scientific—according to the argument of this essay—must somehow think and work his way through to some possible validation of his inquiries in the practical judgments of policy and conduct. There appears to be no other way to avoid mere dallying with make-believe problem solving.

I should like, however, to call attention to the fact that this particular formulation carries with it implications of very profound change in the orientation of our thinking about both economic theory and policy. So far as I know these particular suggestions are new in their reference to economic analysis. This should in itself serve as adequate warning about the possibilities of error in them. But having mentioned the possible dangers, I want to affirm the possibly great advances in thought which such distinctions may hold.

The issues at bottom are nothing less than the question of whether and how valuations may be investigated. The present argument contends that they can be investigated and suggests that the source of evidence is in the practices, the actual performance of persons in the relevant situational contexts.

Furthermore the view that economic theory is simply a part of our methodology would cut the heart right out of the use of economic models as criteria of public policy. (This does not touch the question of the use of models as instruments of investigation.) One of the important implications of this distinction between scientific and practical judgments is that public policy proposals must be formulated as possible ideal guides to practical judgments about policy matters. The prevalent practice among orthodox-minded economists of setting up some model of perfect resource use and then assuming that this is the proper criterion of policy would

have to be abandoned—as a method of getting policy criteria. Judgments of public policy like any and all other practical judgments must be formulated with reference to possible courses of action within available alternatives under the circumstances of the situation. According to the view of this essay it is a part of the task of scientific inquiry actually to analyze and formulate the problems of public policy. Problem-solving is essentially the removal of the troublesome factors in a situation which are the source of the confusion, difficulty, insecurity, etc. Problem-solving removes the blocks which obstruct orderly and satisfying activity. When problem-solving and evaluation are formulated as a part of the functioning of practical judgments, it is obvious that a profound break is implied with the present practice of setting up perfect models as criteria which are arbitrarily assumed to be relevant standards of judgment in the situations. In the latter view, the problem becomes the discrepancy between the actual situation and the assumed ideal. The “solution” then turns out to be some project which would bend “reality” to conform to the model.

The relationship between scientific and practical judgments represents essentially the division of function between research and extension in the Land Grant College system. This function should be one of reciprocal complementation. Such a relationship would seem to be the natural outcome of viewing scientific economic research according to the thesis of this essay. If the task of scientific economic research is conceived of as the discovery of the ideas and facts which are relevant to, and effective in, practical judgments, then there can be neither complete separation of research and extension nor any possible conflict between these functions. The research investigator is interested in these ideas as guides to action and the relevant facts as a matter of truth discovery; and the research cannot, on scientific grounds, be said to be completed, as fundamental research, until the conjoint functioning of these guiding principles and relevant facts are understood in their mutual interrelations. The extension worker is interested in the same findings, but he uses them to suggest improvements in the practical decisions of farmers for converting resources into uses and enjoyment.

The Problem of Classification in Statistics

The classification of data is one of the key points in statistical analysis; it is through systematic classification that the vast masses

of material are reduced to forms in which they can be compared, analyzed and even comprehended. The question, therefore, of just how classes are defined is a strategic problem in the whole theory and process of inquiry.

The most common answer of statisticians to this question, judged by recognized textbooks in the field is that the data are classified by characteristics or attributes.²³ But if one inquires, "Which characteristics and why?" the explanations are not very illuminating; however Bowley²⁴ at least, does work out the argument in a way which permits an approximate joining of the issues with those of logical theory. But the main point here is not to try to comment on the adequacy of statistical treatises, but rather to indicate the way in which the problem of classification in statistics fits into the larger continuum of inquiry.

More specifically, the need is to see how statistical analysis fits into or extends the general processes of induction-deduction in inquiry. The inductive process consists in establishing general propositions which classify particular instances of fact. These general classifications are defined through the speculative-deductive reasoning which defines the possible relations of characters in the form of hypotheses. This array of hypotheses is gradually narrowed down to the one definition which is most productive in directing generalization—from particular instances through the formation of "singulars" which become, in turn, instances of the general classes.

In simplest terms, there are two requirements of this inductive-deductive process which need to be noted here. (1) The classes used in classifying facts are those established within the inquiry itself. The classes are not "in the facts"; the classes are a part of the purpose and procedure of inquiry. Even though we classify things by their characteristics, the characteristics used are those which have been tentatively established as "meaningful signs" or as "traits" significant for the inquiry. (2) This requirement gives the statistical "classes" the logical status of the generic propositions, with the definitions by which they are distinguished derived from the relevant systems of theory. In economic investigation this is economic

²³ For example, Chaddock R. R., *Principles and Methods of Statistics*. Houghton Mifflin, 1925, Chap. IV, or Yule, G. Udney, *An Introduction to the Theory of Statistics*, Charles Griffin, London, 1929, Part I. The Theory of Attributes.

²⁴ Arthur L. Bowley, *Elements of Statistics*, King & Son, London, 1937.

theory in the broad sense of the term, ideally a system of hypothetical universal propositions.

Economic theory functions in investigations, then, as a general system of definitions which directs the formation of classes. Precisely how this is done is a very subtle and complex affair. It is evident that theory is the method of exploring possibilities. It is also generally agreed that the formation of hypotheses is an essential part of investigation. These hypotheses are tentative "explanations" which are gradually whittled away by investigation to the "best" explanation under the circumstances. Ideally, the contest of hypotheses is a matter of "survival of the fittest" explanation.

It is fairly easy to conceive of an hypothesis as a possible explanation. But in any field of inquiry worthy of professional standing, "ad hoc" hypotheses have a very tentative status. Not until the hypothesis is made an integral part of the general theory can the hypothesis be viewed as genuinely acceptable. This is of course a two-way adjustment; a new hypothesis may have such demonstrable validity that it forces a reconstruction of a large part of previously accepted theory.

As long as the hypothesis is in serious doubt the relevant classification of fact is likewise a matter of question. Consequently both the best hypotheses and prospectively fruitful classifications of fact must be worked out in some sort of pilot studies. Perhaps this relationship can be made explicit by brief attention to the problem of sampling in relation to the formation of classes. All investigators are agreed that some sort of "sampling" is an essential part of social and economic research. However, there is evidently a genuine problem of the relation of the sample to the formation of classes which requires explicit formulation.

The purpose of a representative sample, as it is generally conceived, is to draw out or select sufficient cases so that the "characteristics" of the sample represent adequately the characteristics of the parent universe from which the sample is drawn. The essence of the whole procedure is simply this: how do we go about getting a reliable estimate of the universe from which, in turn, reliable inferences of fact may be drawn—without undertaking to analyze a complete enumeration (even where this is imaginable).

But this procedure would appear to assume that the sampler knows what characteristics are relevant to the inquiry and how they might be classified when found. Unless one assumes that the charac-

teristics themselves are the basis of classification—just in and of themselves, as natural (ontological) classes in the Aristotelian sense—then the drawing of and attempting to analyze a representative sample (in the above defined sense) runs the risk of being both haphazard and expensive. In the determination of relevance, an investigator would almost surely find that he had a vast amount of irrelevant and unusable material in such a “random” sample taken as a first step in inquiry. This would seem to be especially true for social affairs, where each observation combines many interrelated characteristics.

It seems necessary to draw a different kind of a “representative” sample at an earlier stage in the analysis, before the comprehensive representative sample (in the usual sense) is drawn. Possibly enough may be known from previous investigations to make the first sample unnecessary—but the function remains.

What is required from the first sample is that it shall represent, not the *distribution* of characteristics in the universe, but the *full range of possible combinations* of characteristics. The first questions are, how are the characteristics related to each other and of what are they traits? It is conceivable that one single case might embrace the full range of combinations of characteristics—but since this is unlikely the number of instances would have to be drawn from various situations and examined until further examination held the promise of no further new combinations. Nor would this be just a blind affair; the scope of the inquiry itself would suggest the range. Essentially this stage of the inquiry is that of the “case method”—whether the case be a farm, a family, a career of a farmer, a market, a cooperative or a business cycle. The point is that analysis at this stage is concerned with the pattern and significance of characteristics, not the frequency of their occurrence.

This makes a distinction between induction and the determination of frequencies within classes. The inductive process is fundamentally the understanding of how to place a particular case in a general class through the possible reconstitution of a representative singular case as an instance of this general class. In effect then the inductive process is actually completed with the formation of the classes. The frequency with which particulars occur is an additional and independent question.²⁵ It appears that the two steps

²⁵ It was the interest in induction, in the problem of the formation of classes which I take to be the ground of the late Leonard Salter's interest in the “case-

cannot be taken simultaneously. The aim of the "representative" sample in the usual sense of the term seems to me to be directed to the questions of frequencies rather than of induction in the accurate sense of the term.

The logical requirements of classification explain the difficulties of and the increasing concern for the handling of basic economic data—the census and in agriculture, the many collections of data by the crop and livestock reporting service. The general problems here are recognized, of course, by the workers in these various fields; but the explicit attention to them here will indicate the relationships of data classification to the larger continuum of inquiry. We are in this predicament: that the data collected by these various agencies are basic to countless analyses yet the very collection and tabulation of these data must take into account the function of the data in ultimate administration and investigation. It is axiomatic and inherent in the nature of facts, that the questions to be answered by analysis must be implicit in the questions asked of experience (or events) in collecting the data. On logical grounds alone, this makes the collection of data not only an integral part of the research (and administrative) process, but one of the most difficult. On theoretical grounds, we need not only to anticipate the many possible uses in research; these uses need to be so thoroughly comprehended that we know which general facts will be relevant in the various research and administrative contexts. Only the most general facts of the many conceivable "general" situations can be secured by the basic data collection agencies. At one time, no doubt, common sense classifications were sufficient to this need, henceforth it would seem that this field of endeavor requires the most intense efforts in the interpretation of research procedures. In short, the data if genuinely useful, must be classified according to criteria developed in the very processes of inquiry and administration.

The function of statistical analysis in research is essentially that of reducing all explanations other than the one finally accepted to an absurdity. It is through speculation that the possibilities of all sorts, including possible theoretical concepts, are formulated. It is the social task of statistical analysis to eliminate most of these

grouping" method of classification: this *Journal*, Nov. 1942, Vol. 24, No. 4. Also his thesis, "A Critical Review of Research in Land Economics," Univ. Minn. Press, 1948. Salter had an almost passionate disbelief in the method of classification by the simple procedure of "looking for uniformities" in the data. And in this belief he was profoundly wise.

possible explanations without conducting wholesale public experiments to try them out.

This in turn is the ultimate justification of free intellectual inquiry in society; it is through free inquiry that the countless alternatives of society are formulated; it is only through the most hard-headed and systematic analysis that the full range of imaginable alternatives can be narrowed down to a statement of the reasonable alternatives under the existing circumstances.

INPUT-OUTPUT RELATIONSHIPS IN EGG PRODUCTION¹

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Introduction

BECAUSE of their importance in the maximum utilization of feeds and concentrates, relationships between feed inputs and livestock production have been the subject of many research studies. In the case of meat production it was early demonstrated that the input-output function follows that of the principle of diminishing increment.²

Theoretically a similar relationship might be expected in the production of eggs. Less is known, however, about input-output relationships in egg production than in the production of milk, beef and pork. Little information is available regarding the response in egg production obtained from different levels of feeding, although it would appear that experimental work with chickens would be relatively simple as compared with larger animals. This paper attempts to examine available information and to explore this relationship in somewhat greater detail than has previously been done.

The feed consumed by chickens consists almost entirely of grain and high-protein concentrates. It is estimated that of the total livestock consumption of grain and concentrates in the United States, poultry receive more than a fifth, dairy cattle use almost as much, and hogs consume more than a third. The remainder is used for fattening of cattle and for other livestock.³ Of the total grain and concentrates consumed by poultry it is estimated that a little less than three-fourths is used by chickens kept for eggs. This is a substantial quantity and in 1948 it amounted to nearly 16 million tons.

¹ The writer wishes to acknowledge the suggestions received from Ronald L. Mighell, John W. Klein, BAE, H. R. Bird, BAI, and other co-workers in the U.S.D.A. The work represented by this article was supported in part by the Bankhead-Jones Special Research Fund.

² Spillman, W. J. "Law of Diminishing Increment in the Fattening of Steers and Hogs," this Journal, April 1924, and *The Law of Diminishing Returns* by W. J. Spillman and Emil Lang, World Book Company, Chicago 1924.

³ Jennings, R. D., "Consumption of Feed by Livestock," Circular 836. (In Press)

Input-Output Relationships in Livestock Production

The feed-production relationships for livestock at various levels of feeding are known only in their broadest aspects. Experiments conducted in this field by natural scientists in the State Agricultural Experiment Stations and in the United States Department of Agriculture have in most cases been designed to determine the more desirable feeding standards and rations. These experiments have been concerned with the more immediate problem of obtaining increased production, rather than with the less pressing problem of determining the extent to which production varies with different levels of feeding. Only recently has it been recognized that the relationship between feed intake and production for milk is enough different from feeding standards to justify further research.

Several important feed-production relationships should be mentioned briefly in order to indicate more clearly the particular relationship we are concerned about here. One of these feed-production relationships is that found in production of meat from growing animals. The diminishing returns relationship is of economic significance here because the relative prices of feed and meat animals of various grades determine the point on the curve to which it pays to feed.

Feeding standards such as those recommended for use in feeding milk cows and laying hens are ratios of feed to production. The higher the production the larger is the quantity fed. Because of variation in capacity, different cows and laying hens consume different quantities of feed when fed to produce maximum output. Such data are sometimes erroneously used to construct input-output relationships, although the variation found in feed intake is a result simply of differences in inherent capacity to produce.

Another type of feed-production relationship is that obtained by feeding animals of the same inherent productivity at different levels in order to determine the input-output relationship. This is the type of relationship which needs to be investigated in production of eggs. In the production of milk this relationship was determined in a special research project undertaken by the United States Department of Agriculture in cooperation with 10 State agricultural experiment stations. A report was issued in 1942.⁴ It was

⁴ Jensen, Einar, Klein, John W., Rauchenstein, Emil, Woodward, T. E. and Smith, R. H., "Input-Output Relationships in Milk Production," U.S.D.A. Tech. Bul. No. 815, May 1942.

found that as production of milk is increased by heavier feeding there is a smaller increase in output for each additional unit of feed used than feeding standards would have indicated. The law of diminishing physical increments was also found to apply.

Input-Output Relationships in Egg Production

Many feeding experiments with chickens have been conducted for the purpose of determining what the effect would be on egg production or on the health of the chickens, if one or more of the necessary nutrients were increased or eliminated or fed in quantities considered inadequate to provide normal requirements. This specialized type of input-output feeding experiment is extremely useful in testing the economic importance and need for different nutrients, but it has limited value for an economic appraisal of general input-output relationships for different levels of feeding. Another type of data on feed consumption and egg production is that available from egg laying contests. In these contests the birds are fed all they will eat of a balanced ration in order to determine the productive capacity of different strains of layers. The relationships of feed to production of eggs obtained in these contests are like those obtained for milk cows in establishing milk or butterfat records. Such data would be expected to show a straight line relationship between feed intake and production in the absence of any reason for assuming that higher capacity birds would make more or less efficient use of the production ration.⁵

In a study in Utah an attempt was made by Wells and Clawson to use data as to feed consumption and egg production from farm flocks to measure the feed-production relationships.⁶ The data were obtained from commercial egg-producing Leghorn flocks and, so far as could be judged at the time the average productive efficiencies and capacities of the various flocks were thought to be approximately equal. The data came from well-managed flocks in which the layers apparently were fed as much as they would eat. However, they were probably not fed equally well-balanced rations. The variation in the relationship between feed intake and production may therefore have been chiefly a result of variations from farm to farm in numerous factors. At any rate, as there is no assur-

⁵ Brody, S., Funk, E. M. and Kempster, H. L., "Growth and Development." Mo. Agr. Expt. Sta. Research Bul. 278, p. 46.

⁶ Wells, O. V. and Clawson, Marion, "A Study of Egg Production per Hen in Central Utah" This Journal, Vol. XV, October 1933, p. 633.

ance of the real differences in the levels at which the layers were fed these data are suitable only for a rough approximation of the relationship of feed to production of eggs under farm conditions. The data are similar in some respects to those obtained in egg-laying contests, except that in laying contests the greater degree of control makes it more certain that a measure of the capacity of the birds to produce eggs has been obtained.⁷ Neither the data from egg-laying contests nor those from farm records or surveys appear to lend themselves to an analysis of the nature of the feed-egg input-output relationship. The study presented by Wells and Clawson did not reach a conclusion in this respect, although a recent textbook using this study as a basis implies that a diminishing returns relationship may exist.⁸

The most revealing study available appears to be one undertaken by the United States Department of Agriculture at the Southwest Poultry Experiment Station, Glendale, Arizona, in 1936 and 1937.⁹ This experiment was set up for the purpose of determining the effect of limited feeding on egg production rather than to measure the effect of additional feeding. This appears to approach the problem in an inverted fashion and may have influenced the results for our present purpose, as the rations were adjusted primarily to fit the full-feeding level. Nevertheless, this controlled experiment is very suggestive.

The experiment at Glendale consisted of two parts, each covering a period of a year. One part of the experiment began December 24, 1935, and ended December 23, 1936. Another part of the experiment began January 8, 1936, and ended January 6, 1937. The White Leghorn pullets used were divided into groups of 25 each. All were the same strain and as nearly as possible the same weight. In the first part of the experiment three groups of 25 birds each were fed different quantities of an all-mash ration. The first group in this lot was given free access (*ad libitum*) to the diet and thus got all they would eat. A second group was given only 87.5 percent of that eaten by the first group the previous day and a third group only 75 percent of that quantity. This was repeated with another

⁷ "Maryland Egg Laying Contests." Maryland Agricultural Experiment Station Bul. 359.

⁸ Black, J. D., Clawson, Marion, Sayre, C. R. and Wilcox, W. W. "Farm Management," p. 938.

⁹ Heywang, Burt W. "The Effect of Restricted Feed Intake on Egg Weight, Egg Production and Body Weight." *Poultry Science*, Jan. 1940, Vol. XIX, No. 1, p. 29.

lot of three groups averaging somewhat less in weight. The results of the first lot of three groups are shown under a, and that of the next lot of three groups under b in the chart (Fig. 1).

In the second part of the experiment eight groups of pullets were used. Three of these groups were used to repeat the experiment explained above, and the results are shown under c in the chart.¹⁰

A summary of the experiment is presented in Table 1. This shows that a reduction of 12.5 percent in the feed intake cut egg production to 68.2 percent of that obtained when the layers were fed all they would eat. When there was a reduction of 25 percent in the feed intake, production of eggs dropped to 47.5 percent of that for the full-fed level. The relationship found may also be expressed by saying that production of eggs dropped a little more than twice as much as the reduction made in the rate of feeding.

TABLE 1. EFFECT OF REDUCED FEED INTAKE ON EGG PRODUCTION

Level of feeding ^a	Percentage of level 1		Eggs produced		
	Rate of feeding	Eggs per layer ^b	Lot a	Lot b	Lot c
	<i>Percent</i>	<i>Percent</i>	<i>Number</i>	<i>Number</i>	<i>Number</i>
1	100	100	193	146	171
2	87.5	68.2	127	101	120
3	75.0	47.5	90	67	85

^a All groups under level 1 were given all they would eat.

^b Averages of the three groups fed at the same level.

As shown in Figure 1 by the similarity of the three curves, the results are nearly identical. Differences in the level of production among the three experiments (lots) were apparently caused by the difference in weight of the layers used. The layers in the three groups in lot b averaged considerably smaller than those in the six groups in the other 2 lots.

¹⁰ The other five groups of pullets were fed different quantities of the diet for a part of the period. Approximately half way through the experiment the quantities were changed in order to observe whether this would result in a change in egg production, egg weight, and body weight of layers. Production changed in accordance with feed intake, egg weight remained nearly constant, and average body weight was not significantly affected by restricted feed intake. The most important finding in this part of the experiment is perhaps summed up in the observation that the egg production of layers apparently can be increased again to approximately the full quantity permitted by their capacity when the amount of feed intake is increased even though the feed intake has been as low as 75 percent of what they might have eaten *ad libitum*. This is quite different from the situation with milk cows where the milk flow once reduced during the lactation period can only rarely be brought up appreciably during that lactation period.

The results indicate a slightly increasing returns relationship as the layers were fed more nearly the full quantity they would eat. The feed-production relationship from the farm survey in Utah is plotted in Figure 1 in order that the slope for these data may be compared with that of the input-output data from Glendale. The relationships between feed and egg production from the Maryland

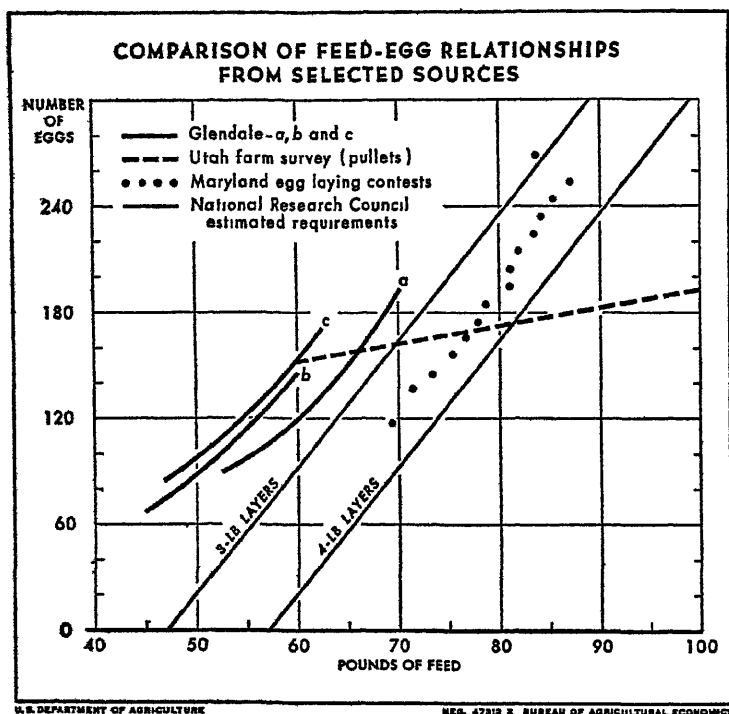


FIG. 1.—The feed-egg relationships from Glendale are based on various levels of feeding for strains of the same productive capacity. Data from egg laying contests and estimated feed requirements from NRC show the feed consumed by layers of various capacities. The Utah survey data probably hold an intermediate position, measuring partly capacities and partly differences in ration and management from farm to farm.

egg-laying contests and from feed requirements published by the National Research Council are shown. There is a surprising similarity in the slope of relationships obtained at Glendale and those shown for the egg-laying contests and the feed requirements where-

as the relationship obtained from the farm survey data is quite different. The marginal efficiency of production on the farms in Utah seems quite low as it takes about 40 pounds of additional feed to increase average production by 50 eggs. A comparison of the data from Glendale with the approximate feed requirements estimated by the National Research Council¹¹ as represented by the straight lines in the chart indicates that the layers used in the Glendale experiment were relatively efficient producers. This may be due in part to better than average climatic conditions at Glendale, Arizona. Another explanation is that the estimated feed requirements represent average values for both light and heavy breeds and are sufficiently high so that an adequate quantity of nutrients is assured even under unfavorable conditions.

A generous ration is not utilized as efficiently as a less adequate ration. Morrison, for example, states that "a liberal ration is not digested and utilized quite so completely as a scanty ration. For this reason . . . a cow in milk which is fed with the liberality necessary to produce a good yield of milk undoubtedly needs more feed for mere body maintenance than she would if she were fed a scanty ration that would be sufficient to maintain her weight when dry."¹²

According to the results obtained, the strains of White Leghorns used in the Glendale experiment were highly efficient. The groups fed ad libitum (all they would eat) were consuming slightly less than estimated requirements but the groups fed only 87.5 and 75 percent as much were getting considerably less feed than ordinarily would be required by layers of similar weight and production. In the groups which were fed at these reduced rates it must be assumed that the feed was very efficiently utilized. The net result was uneconomical, however, because of the large decrease in production of eggs although the average weight of the layers remained fairly constant.

Conclusions Which May Be Drawn from the Glendale Data

The most significant conclusion which may be drawn from the Glendale experiment is that there is nothing within the range of the data to indicate a decreasing return for additional units of input.

¹¹ Cravens, W. W., Almquist, H. J., Norris, L. C., Bethke, R. M., Titus, H. W. *Recommended Nutrient Allowances for Poultry*, A Report of the Committee on Animal Nutrition, National Research Council, Washington, D.C., 1944.

¹² Morrison, F. B., *Feeds and Feeding*, p. 76, Ithaca, New York, 1937.

On the contrary the results seem rather to imply a slightly increasing return relationship.

Two possible explanations appear for the apparent tendency toward increasing returns. The first lies in the nature of the experiment itself, in which the feed intake was reduced by exact percentages from ad libitum feeding. The feed mixture which originally was well balanced for the needs of the layers at full capacity became less well balanced. In other words, when the total feed intake was reduced 12.5 and 25 percent some nutritional factors may have been in greater relative scarcity than others. If this were the case it might explain the increasing returns slope of the curve.

From a theoretical standpoint it would be extremely interesting to learn whether the input-output relationship in egg production reaches a point at which a diminishing output is obtained for each additional unit of input. In the Glendale experiment, for example, it is possible that the use of several more groups of pullets fed, say, 2.5 percent less than the "ad libitum" group and another fed five percent less, a third 7.5 percent less and so forth, might have indicated a point at which production would have increased at a declining rate. Insofar as can be seen it would appear that this point in any case is so near the point of maximum feed intake and production that it probably would not be of practical significance to poultry farmers.

The second possibility is that the capacity of these layers to utilize feed for production of eggs was relatively low. In fact, so low that even at the upper levels of production the relationship between input and output still did not reach into what might be called the economic range. That is consumption of feed did not reach the point on a theoretical curve at which diminishing increments begin.

This hypothesis is mentioned because of its possible application, if true, to future breeding work. If production of eggs as indicated by Brody, et al. may be limited by the capacity of the metabolic system of the layers, future progress in breeding for greater capacity might some day push the input-output relationship into an area of diminishing returns.¹³ Meanwhile, the data from the Glendale experiment seem to indicate that the input-output relationship

¹³ Brody, Samuel, Funk, E. M. and Kempster, H. L., *Growth and Development* Mo. Agr. Expt. Sta. Research Bul. 273, p. 30, March 1938.

is not that of diminishing returns up to the point of maximum capacity of the layers used.

Economic Application—Practical Use

In appraising the conclusions from the Glendale experiment one must be careful to distinguish between the findings of the study as applied to conditions such as those set up in the experiment and the wider application to poultry feeding under other conditions. As in the case of any experimental study, the application of results to a wider area is a problem in sampling and inference.

In this case, it is clear from the experimental results that for the conditions studied, feeding the layers all they would take of a well-balanced ration was most profitable. For the three levels studied there was no indication of diminishing marginal returns. Other evidence of a less direct and conclusive nature, also seems to be in agreement. We can say therefore that within the usual range of feeding experience, it is probable that layers fed to capacity will either show no diminishing marginal return increments or if they should, it would be so little as to be of minor consequence.

At the same time it should be pointed out that the experiment was restricted to three levels, that it covered only one strain of Leghorns in one location, and that the ration for each of the three levels was not adjusted in composition. It might well be that changes in those factors or others would result in the appearance of some diminishing marginal relationships. In fact it seems almost certain that in the nature of things, some diminishing marginal relationships would appear in connection with some of these possibilities.

However, let us assume for the moment, that the essentially straight line relationship found is generally applicable and consider what it would mean. First of all, it strongly reinforces the recommendation that has been stressed by poultry extension workers that hens should be fed to their full capacity of a well-balanced ration. For flocks fed for commercial egg production it means that adjustments in feeding to meet changes in economic conditions should be made by adjusting numbers of layers (culling), rather than by changing feeding rates. In this respect feeding for egg production appears to differ from feeding in other types of livestock production. The input-output relationship in feeding milk cows, for example, is definitely one of decreasing increments, so

that adjusting the quantity of feed per cow is one of the most important means of adjusting to changes in milk-feed price relationships. Again in feeding hogs, beef cattle, and poultry for meat production, the diminishing marginal gains from additional feeding of concentrates are so important as to play a very important role in working out the most economic feeding rate. Not so in egg production within the usual ranges of feeding adjustment.

In some respects this means that the egg producer has a simpler feeding problem than producers of other livestock products. The chief problem is that of getting the layers to eat as much as their capacity permits. The work of Brody and his co-workers, referred to earlier, suggests that laying capacity is limited by the hen's ability to assimilate feed. The fundamental reason for the higher relative maintenance ration for the hen as compared with the milk cow lies in this situation. Improved breeding has been effective by increasing the hen's ability to handle more feed and convert it into eggs. Apparently higher rates of egg production have not been associated with any decrease in marginal efficiency in feed conversion.

The above reasoning suggests also that there may be room for further progress in increasing egg production per bird if means can be found for stepping up the hen's physiological capacity. This may become possible either through breeding, feeding, or some combination with management.

Work with amino acids, and other nutritional factors indicates that the way is still open. Both the feed-egg relationship found in the Glendale experiment and the high percentage of feed used for maintenance in the case of the hen means that as production increases, the average output per unit of feed increases more rapidly than is the case with many other types of livestock production.

The Glendale experiment, although suggestive, is limited in application. This type of work needs to be expanded to cover additional situations and conditions. Additional work on input-output relationships in egg production might well be done as a joint poultry-husbandry and farm-management project perhaps in cooperation with several state agricultural experiment stations, following the pattern used in the input-output study in milk production.¹⁴ The project should include use of other breeds and strains of chickens and different rations fed at a greater number of different levels of feed intake than were used at Glendale, Arizona.

¹⁴ Jensen and associates, *op. cit.*

THE STATUS AND POSSIBILITIES OF RURAL PRODUCING COOPERATIVES

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M. R. T. V. EMCLIANOFF at the end of his book, *Economic Theory of Cooperation*,¹ concludes that: "‘Productive’ cooperative associations . . . always (have) been a favorite type, supported by public opinion, by its socio-reformistic enthusiasts, by governments in various states, and by special subsidies, public and private. Despite this, and notwithstanding never-ceasing attempts to promote and organize such associations, they have not demonstrated any viability and still remain a lifeless theoretical scheme without any chance of realization in a surveyable future."

In spite of this categorical statement a reconsideration of the status of producing cooperatives in general and rural producing cooperatives in particular appears to be warranted, if only for two reasons. First, and this aspect appears to be of primary interest at this particular time, it may be well to consider whether and to what extent rural producing cooperatives can play a role in the implementation of President Truman's bold New Program, point four of his 1949 Inaugural Address. Second, the Russian and Israeli experiment with regard to rural producing cooperatives on a large scale, as well as the numerous machinery pools in various countries, including the United States, furnish interesting material for analysis. To study the possibilities and implications of using rural producing cooperatives as an instrument in the development of economically less fortunate and little developed countries, is a major concern of this paper.

Concepts and Characteristics

In order to describe properly some of the main characteristics of rural producing cooperatives, it may be well to indicate first the position occupied by them in relation to other types of cooperative efforts. From an over-all view it is quite convenient to group cooperatives into three major groups according to function.

(1) Purchasing cooperatives, formed by people who pool their

* The writer acknowledges indebtedness to Professors M. R. Benedict and J. B. Condliffe for important suggestions.

¹ Ann Arbor, Michigan, Edwards Brothers, Inc., 1942, pp. 253-254.

needs for goods and services which they purchase jointly. Their primary objective is to purchase more economically or, as it is often called in more technical terms, to maximize their members' satisfaction.

- (2) Marketing cooperatives, formed by producers who pool for joint sale their products which they produce individually. Their primary objective is to assist their members in maximizing their profits.
- (3) Producing cooperatives, formed by producers who pool their labor and/or machinery in order to produce goods and services jointly. Their primary objective is to assist their members in maximizing their profits.

The three major types of cooperation have been presented in this succession for an important reason. The three types follow each other in an order which corresponds to the decrease in the number of fields in which the individual is free to make his own decisions, independent of group decisions. For example, purchasing cooperatives may be considered as a type of cooperation which least curtails private decisions. From this point of view one may say that purchasing cooperatives are the lowest type of cooperation. Almost no purchasing cooperatives require members to patronize exclusively the cooperative store or services. All other facets of the individual member's life are also left untouched.

Not so in the other two types of cooperation. Members of marketing cooperatives often sign agreements to market all of one product (with the exception of that for home use) through the cooperative. It is also common to find members of agricultural marketing cooperatives belonging to related purchasing cooperatives at the same time. In some cases, for instance the California Fruit Growers Exchange, the marketing cooperative also fulfills the functions of a cooperative purchasing agent of fertilizer, packing material, etc. It immediately becomes clear, that membership in a marketing cooperative is likely to curtail a person's private decisions to a larger extent than membership in a purchasing cooperative. Members of producing cooperatives, with the exception of machinery pools, relegate even more of their individual decisions to the cooperative. All producing cooperatives which pool their members' labor simultaneously fulfill also cooperative purchasing and cooperative marketing functions.

Producing cooperatives may be further grouped according to

whether they operate in rural communities or industrial cities. This paper will be concerned with rural producing cooperatives. These may be subdivided into three major types:

- (1) *Rural machinery pools*: It is one of the interesting phenomena of our age that people living in capitalistic, socialistic and communistic countries all pool certain efforts and equipment. The reason is simple. The furnishing of certain goods and services on an individual basis poses problems which are practically insurmountable. People have become accustomed to having national security, police and fire protection, postal services, etc., furnished not on an individualistic private basis, but by public pools. In the same way, all the world over mechanization has apparently induced small holders to pool heavy agricultural machinery, such as tractors, plows, mechanical spraying machines, harvesters, threshers, pumps, etc. It is because of the fact that the small farmer seldom can finance and effectively use large mechanized equipment that rural machinery pools are gaining in importance. In the United States, for instance, a considerable part of rural electrification is carried out on a cooperative basis. Farmers cooperate and with the aid of government loans pool resources to purchase and jointly operate equipment which furnishes their farms with electric power, a service which obviously cannot be economically supplied by each farmer separately.
- (2) *Collective farms with commercial enterprises operated cooperatively*: Since the start of the twentieth century, collective farms in which all commercial enterprises are operated jointly have been on the increase in many countries. Russia, Poland, Bulgaria, India, and Israel are a few of the countries which are experimenting on a rather large scale with this type of rural cooperation. Under such a setup relatively large tracts of land are jointly operated by member-farmers, who have their private individual dwellings and small gardens. On these small plots each family can produce its own fruits and vegetables and can even support some livestock to meet the family's needs for dairy products, eggs and meat. Such collective farms are usually managed by a committee of management elected by the farm's members. At regular intervals the total net returns of the farm are distributed among

its members according to formulae which are based on members' input and participation.

- (3) *Collective farms with all property being pooled and operated cooperatively:* In a very few countries, for instance Israel, a considerable segment of the agricultural sector is composed of collective farms in which members pool all their property. All land, shops, livestock and dwellings are cooperatively operated and, for all practical purposes, no private property exists. No wages are paid, but all individual needs are met by the common treasury. All members are equally compensated. Here, as in type (2), a committee of management, elected by the members, decide the farm's organization, its products, each member's work, etc. This type of rural producing cooperative, indubitably, curtails privacy and individual decision much more than either of the preceding types.

In summary it may be stated that among the various types of rural producing cooperatives, machinery pools curtail individual decisions least and, therefore, their successful operation poses fewer problems than the others. Collective farms in which all property is pooled and jointly operated is the other extreme. Here, group interest and decision almost completely supersedes individual interest and decision. In countries in which for generations people have been accustomed to live their private lives and to make their individual decisions, cooperative efforts inherently generate centrifugal forces which are apt to disrupt cooperation. The more extensive the people's individualistic tradition and the more the individual's interest diverges from that of the cooperative, the stronger will be such disruptive forces. There exist apparently two major forces which can counteract such centrifugal forces. For one, compulsory cooperation offers the dissatisfied members little room for the expression of their feelings and inclinations. On the other hand, common background, beliefs, ideals and outside pressure constitute forces which have proved capable of perpetuating voluntary cooperative efforts for generations. The Mormons and the Israelis furnish good examples of the latter case, while the collectivization by decree in Russia is a good example of the first. Both forces have their limitations. Compulsory collectivization is not consistent with freedom of choice, while, as the outside world changes, common beliefs, ideals and external opposition may dwindle away or lose their comparative importance. It is this latter fact which appar-

ently hit hardest cooperation among the Mormons in the United States.

After these initial general remarks it may be well to consider from close by some of the more important rural producing cooperative efforts of this century. Among the large-scale efforts, the Russian and the Israeli are certainly the most outstanding and therefore warrant some analysis.

The Russian Experiment

After the Russian revolution in 1917 apparently no effective programs for the redistribution of land were implemented in spite of previous discussions. Instead, land-hungry peasants seized and redistributed the land which earlier had been held by large land-owners. As a result the land became more and more subdivided and the State was left with relatively small farming units. At the same time the need for greater agricultural output became more and more urgent. To meet these needs by modernizing and mechanizing agriculture and to tie the farm sector closer to the industrial sector, the planners of the first five year plan (1928-1932) decided to collectivize agriculture. While in 1929 only about four percent of all farms in Russia were rural producing cooperatives, by 1938 they had grown to 94 percent.²

The collectivization of Russian agriculture was carried out under government sponsorship and supervision. It was not a voluntary movement. According to government decrees, rural producing cooperatives, i.e., Kolkhozes, were established. Kolkhozes are a variation of rural producing cooperatives, discussed as type (2). The land of a Kolkhoze belongs to the State, and all commercial enterprises are operated cooperatively while members live in individual dwellings surrounded by small plots of land for individual use. In order to stimulate production by mechanizing agriculture, Kolkhozes are furnished with mechanical equipment by government-owned and -run Machinery and Tractor Stations, which are found all over Russia. Machinery and Tractor Stations receive their equipment directly from the State and make it available, at fixed charges together with expert advice, to the Kolkhozes. It seems that the Machinery and Tractor Stations constitute a major link between the State and each Kolkhoze. Through these stations the State on

² Rabinowitch, Germina, "The Kolkhozes in the U.S.S.R." *Rural Sociology*, Vol. 8, No. 3, Sept. 1943, p. 256.

the one hand furnishes technical advice and instruction, and on the other controls agricultural production of the entire country.

Under this setup the interest of the individual and the group often clashed. Compulsion, usually favoring the group interest, counteracted all centrifugal forces which otherwise might have disrupted the cooperative effort. Thus, when by 1939 the members of many a Kolkhoze had been putting more and more emphasis on their small individual holdings (which were attached to each house), showing strongly individualistic tendencies, the State interfered. In May 1939 the Central Committee of the Communist Party and the Council of People's Commissars of the Soviet Union issued an order which was aimed at protecting land belonging to the collective farms against attempts at individual appropriation on the part of farm members or against attempts to extend individual holdings beyond their original limits.³ In September 1946 another order titled "Measures of Liquidating the Violations of the Charter of the Agricultural Artel in Kolkhoze" was issued.⁴

It should be realized, however, that in spite of all negative aspects of this system, the rural producing cooperatives together with the Machinery and Tractor Stations furnished an excellent instrument through which mass education, training and mechanization could be implemented very rapidly and on a very large scale. In this sense, this system offered a convenient vehicle for the development and improvement of Russian agriculture.

The Israeli Experiment

While the collectivization of farms in Russia was compulsory the movement of rural producing cooperation in Israel was a wholly voluntary, grass-root movement. The Jewish settlers who entered Israel early in the twentieth century had little, if any, farming experience. Living and farming conditions in the new homeland were most challenging, due to the adverse climate, strange and often hostile environment, lack of funds and experience. At the same time, these settlers had been shaken in their belief in the old European system of individualism, and were imbued with an idealistic desire to create a new social order. This ideal was to take the form of large-scale cooperation, a form which helped

³ Rabinowitch, *op cit*, p. 259.

⁴ Jasny, Naum, "The Plight of the Collective Farms," this Journal, Vol. 30, No. 2, May 1948, p. 305.

solve many of their problems such as lack of funds, experience, changed environment, prevalence of disease, etc.

In 1908 the first Kvutzah, a rural producing cooperative of type (3) was established at Daganiah. Since then their number has been increasing steadily. In 1938 about 30 percent of all Jewish villages in Israel were Kvutzoth (plural of Kvutzah) and by 1942 the percentage had increased to about 36 percent. There are two major types of Kvutzoth. One type has an average membership of about 100-200 members while the second, usually referred to as Kibbuz, has a membership of up to 1,000 members. The reason for this difference is primarily a philosophical one. Those who favor the small unit maintain that a cooperative is only an enlarged family consisting of people with common interests and social, cultural and human ties. Those, however, who favor the larger unit maintain that such an environment offers the individual more chances to develop and to associate himself with people who share his social, cultural and human interests.

Each Kvutzah is governed by the general meeting of its members, which elects a committee of management to execute administrative duties. A secretary-treasurer handles the cooperative's finances, a work-organizer assigns each member to his respective job and a Mukhtar handles the cooperative's external relations. Standing committees assist the committee of management.

Thirteen years after the first Kvutzah had been established another type of rural producing cooperative made its appearance. Many settlers who were eager to cultivate the homeland were not willing to give up so much of their individualism. In 1921 the first Moshav-Ovdim was established at Nahalal. A Moshav-Ovdim is a village consisting of individual farms. Each farmer in the village decides what and how much to plant, but big farm machinery, cold storage houses, etc., are purchased and operated on a pool basis. Almost all members belong to the same marketing cooperative as well as purchasing cooperative.

In the late 1930's yet another system of rural producing cooperative was started. In many respects it is a compromise between a Kvutzah and a Moshav-Ovdim. Settlers became more and more aware of benefits which result from large-scale farming as well as from a certain degree of individualism. The Meshek-Meshutaf, a rural producing cooperative of type (2), resembles in many respects the Russian Kolkhoze, with the exception that it is entirely volun-

tary. All commercial enterprises are jointly operated, while each family lives in its own dwellings and cultivates its own small garden. At the end of the year the cooperative's net returns are divided among its members. The remuneration is according to the respective contribution of each member.

There can be little doubt that rural producing cooperatives have been one of the most important factors in the development of Israeli agriculture and to a certain extent of the entire economy. The continuation and perpetuation of rural producing cooperation in the Kvutsoth form is faced by most severe dangers. This type of cooperation minimizes private decision and therewith generates a maximum of centrifugal forces. Once the conditions of the State of Israel and its people have improved sufficiently and the pioneer atmosphere has dissipated, many of the centripetal forces will have disappeared. Life in New England in the early colonial period furnishes an interesting parallel. Adverse conditions exemplified by Indian attacks led to close cooperation between the early pioneers. Once conditions improved, many joint efforts disappeared. The odds are that, without government interference, future types of rural producing cooperatives which leave more room for individualistic tendencies will gain in importance.

Rural Producing Cooperatives and the Development of Economically Underdeveloped Countries

There are strong indications that a sincere effort to better the plight of economically less fortunate people is in the making. It is a fact that almost all of these economically underdeveloped countries are predominantly rural in nature.⁵ As a matter of fact, it is partly because of pronounced rural character that these countries are in many respects backward and have such relatively low standards of living. It is obvious, therefore, that if the standard of living of the people of these underdeveloped countries is going to be raised, an initial major effort has to be made within and by their rural sectors.

In general it appears to be true that in the rural sectors of most economically underdeveloped countries the level of living is relatively low, because output per man-hour is low, technical know-how and training very limited and pressure on the land consider-

⁵ It is estimated that, for instance, at present about 75 percent of China's, 70 percent of India's and 78 percent of Korea's population is engaged in agriculture.

able. The question is whether and how much rural producing co-operation planned to conform to the people's education and tradition can help to improve this state of affairs. It is well to inquire whether and to what extent rural producing cooperatives can contribute by facilitating the gradual mechanization and improvement of agricultural practices, the spread of technical know-how, and the healthy development of small-scale rural industries.

Low productivity of farm labor together with a generally unsatisfactory state of farming in many economically underdeveloped countries is related to the small size of farming units. Land-wasting and work-impeding stone walls or hedges, which so often encircle these small holdings, further complicate the problem. If joint cultivation of certain lands would be accepted, stone walls could be removed and plowing of larger areas of land possible. Gradually larger and more modern equipment could be introduced which in many cases could lead to more productive and desirable cultural practices and, possibly, higher total output. The cooperative would often be able to borrow and pool capital, in order to finance such improved practices, which to individual small holders would prove to be inaccessible. In this connection one should recognize that even in the United States cooperative purchase of heavy farm machinery has been common among farmers for many decades.

One factor, among others, which makes the problem of education and vocational training so difficult in most Far Eastern countries, is the multitude of farms. Under such conditions it is hard for authorities to reach any large number of farmers. Also, farmers who are living on such small land holdings as to be always close to starvation, can hardly afford to try out and introduce better cultural methods. They are often afraid to deviate from the traditional practice, because crop failure may prove to be ruinous and fatal. Once, however, groups of farmers, and in particular producing cooperatives, are found all over the land, the authorities' physical problem of reaching their rural population has greatly diminished. Each cooperative can assist in diffusing information, education and vocational training to the members and see to their judicious application. Because of the fact that all rural producing cooperatives have certain common features, they offer a convenient framework for the general spreading of know-how.

Rural production cooperatives need not necessarily be exclusively agricultural. Many Israeli Kvutsoth not only maintain

shops designed to build and repair certain agricultural equipment houses and tools, but also manufacture certain nonagricultural articles for sale. Rural communities can produce parts of their own nonagricultural needs, while certain amounts of various products can be offered for sale. Products do not necessarily have to be in the nature of end-products, but they may be components of agricultural implements, textile accessories and parts of machine tools which are assembled at factories for further manufacture. The development of small-scale industries by rural cooperatives, besides complementing agricultural efforts, has two very important facets. Almost all economically underdeveloped countries lack capital and capital goods as well as possibilities to acquire them on a large scale in the near future. Here, in the process of initial development rural small-scale industries would come in very handy. Also, such a setup could absorb a considerable part of the population which at present is either not very productively employed or which may no longer be needed in agriculture once cooperation is introduced.

It seems, therefore, that rural producing cooperatives can fulfill an important part in the economic development of underdeveloped countries. Mahatma Gandhi and his followers go even further, hoping that rural producing cooperation will assist in the raising of people's standard of life as distinguished from raising their standard of living.⁶ This, however, is outside the scope of this paper. Instead, some of the problems which are related to the introduction and expansion of rural producing cooperatives in economically underdeveloped countries will be considered.

It should be realized that not all countries, if they use cooperative producing methods at all, will and should use the same method. Education and traditions will and should be one of the major factors which determine the type of rural producing cooperative. Farmers like the American farmers, for example, who are accustomed to individual farming can hardly be induced voluntarily to join collective farms. Still the same farmers may be willing to join various machinery pools. At the same time, it might be expected that the village farming which existed in India prior to the British Administration would furnish an important precedent and tradition on which relatively widespread rural producing cooperation could be built.

⁶ In Gandhi's vocabulary "standard of life" relates to the human and social side of life while "standard of living" relates to the material side.

With respect to the speed with which rural producing cooperation can be introduced and expanded there will in general be a difference as to whether the cooperative effort is voluntary or compulsory. Voluntary cooperation historically always has been a relatively slow process. Whatever the conditions would be under which the various economically underdeveloped countries would introduce and broaden cooperation, they would be badly handicapped by lack of local leaders and managers, who could successfully head cooperatives. If nothing else, paucity in number of trained personnel who would be able to organize and head cooperatives will considerably slow down potential rural cooperation in these countries. Recognizing this fact these countries should make an all out effort to train leaders and personnel.

In conclusion it may be stated that at present in many countries rural producing cooperatives exist. In certain countries they constitute important parts of the agricultural sector. As the world gains in cooperative experience and it becomes increasingly clear that certain facets of rural producing cooperation may constitute convenient tools in the development of underdeveloped countries, cooperative rural producing efforts may very well gain in importance. Rural producing cooperatives can facilitate gradual mechanization and improvement of agricultural practices, spreading of technical know-how and rural small-scale industrialization. It is for this reason that India and China very likely will soon furnish a large-scale testing ground for various types of rural producing cooperatives. Some Near Eastern countries with the Israeli experiment before them are beginning to think of launching their own experiments in this field. There seems to be no reason why, with proper guidance, the benefits of rural producing cooperatives cannot be reaped under various types of government.

NOTES

SOME RULES FOR MAKING ECONOMIC STUDIES IN A POLITICAL ENVIRONMENT

1. Be sure the sponsoring agency is square and wants an honest job done.
2. Get a clear concise assignment.
3. Stick to your study.
4. Don't play politics yourself.
5. Stay out of the newspapers.
6. Let your job speak for itself.
7. Report only to your own chairman. Let him take the bows—and the brickbats.
8. Be sure you have a reasonable amount of emotional stability, otherwise you will be quite unhappy.
9. Don't try to answer political attacks.
10. Be fair with the people you are studying. Give them a fair, complete hearing. Be sure you understand them. Accept no favors but don't be stand-offish and holy. Have a clear understanding with top management. If you play it square, they will respect you even if they don't agree. Keep your mouth shut. Don't gossip. If a company can influence you, they will not respect you and will be slow to take you into confidence.
11. Report *all* the facts. Don't color them or emphasize them to support your own or any one else's prejudices.

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A COMMENT ON "PLANNING AND CONTROL"*

PLANNING AND CONTROL, admitted to the field of respectable economics very reluctantly and only because of war and depression emergency, I submit are now with us to stay. They are here not as stepchildren or temporary expedients. They have so completely pervaded our system that only those on the most stubborn fringes of intellectual life continue to rant that the "norm" is the automatic system of classical economics and that all these interferences are merely temporary and unholy aberrations from the "norm." I refer, of course, to the National Association of Manu-

* This note is a digest of extemporaneous remarks made at Laramie, Wyo., August 19, 1949.

facturers and the instructors in nine-tenths of all courses in elementary economic principles. The prevailing attitude at the meeting of the American Farm Economics Association at Laramie was in striking contrast, in this regard, to that of the three-day Forum of Labor, Agriculture and Industry held there immediately preceding. Throughout that "Forum," heavily weighted on the side of what I shall call, in polite understatement, "conservatism," was an undercurrent of dreadful fear regarding "planning and control" of economic activity. At the AFEA meeting they were accepted as necessities; the most conservative statements heard being but requests that controls be kept to a minimum and that bureaucracy please quit acting so almighty and be a little more responsive to the decent and respectable local-powers-that-be. Farm economists have apparently become the leading iconoclasts of this day, albeit with great reluctance—with reluctance because it scares anyone to find his precious little stock of absolute truths melting away.

Are we ready for an age when humans will determine their own destiny and so-called natural laws will be repealed one after the other? Obviously not, as we were not ready for the atom bomb or as society is never ready for what remorseless technological progress forces upon it. Yet, we must succeed. I quote from Mr. Harold Rowe's paper:¹

"My own interest in this whole subject is rooted partly in a belief that study of the war experience can yield results applicable to conditions of peace as well as to those of war. In a way, it reflects a suspicion that the economic conditions of a military emergency are not so basically different from those that may develop in other situations, and hence are not so exceptional as is oftentimes supposed. Greatly expanded government intervention in the operation of the branch of the economy which receives primary attention in the work of the majority of us here has been based upon more or less continuous recognition of some degree of cyclical or war emergency throughout most of our experience."

I submit that the United States is henceforth arrived at a point where the need for planning and control is accepted as a datum. The world other than the new world has been in such state for some time, but the new world has not, because of its great good fortune in location, physical resources, and youth. I quote again from Mr. Rowe:

¹ Presented at Laramie and to be incorporated in a forthcoming Brookings Foundation publication.

"If, to use a classification sometimes employed by military experts, instead of comfortable war such as the last, we were to experience an austere war, this compulsion toward planning would be greater. Conditions in a real war for survival would call for complete planning."

Many of us believe that the world as we prefer it, is now at war for survival against the world as we do not prefer it. I shall omit entirely discussing the question of "why" or "whose fault."

But our foundations have fallen away. We find in the haphazard control experiences of the war that if the so-called automatic allocation of goods in the market according to demand expressed in money is no longer available to us, we are lost. There may be other allocation measures conceivable to man. Measures of necessity, technological and psychological, can perhaps some day be discovered and charted on a grand combination of thermocouples, ammeters, and "electrocraniographs," but we do not have them today. About all we have so far are public opinion polls and a growing body of social investigation and research, various segments of which we represent.

We practitioners of the art of economics stand before the economic facts of life in 1949 pretty naked. It is my humble opinion that an admission of that would do us a lot of good and perhaps open our minds to some possible answers which cannot now penetrate through the rank growth of dogma that heretofore has had possession.

As an exercise in rejecting dogma I refer to a portion of Mr. M. K. Bennett's paper² where he says:

"The producers are to become stepchildren even more than before—residual claimants to what they produce and debtors to the state whenever crop failure, equally with their own recalcitrance, occasions a shortage in their deliveries to the state. What a contrast with the position of agricultural producers in the United States! . . . Finally, there is reason to query the possibility of marked improvement in livestock output so long as the farmers do not own their stock and must collectively market the product as the state decides. Why should efficient husbandry be expected of them? Is it to be supposed that either patriotism or fear of punishment for neglect could, in the care and feeding of animals, substitute at all fully for the incentive of private ownership? I doubt it.

"Adding all of these doubts together, I am inclined to appraise as rather remote the probability that the Soviet Union under its present system of government will have achieved by 1959 a composition of the national diet much better than it was . . ."

² Presented at the Annual Meetings at Laramie.

I submit that in this excellent description of Soviet food potential, these personal judgments are misleading. Believe me, these ownership factors, which some people might call "natural instincts," are not necessarily so at all. I agree with Mr. Bennett that the Soviet Union cannot by decree affect rainfall and wind, but it can change many purely social, as opposed to physical, "instincts." I saw this kind of fanaticism in action in Germany in 1937, 1938, and 1939, and knew several brilliant young Russian officers in Korea in 1946, 1947, and 1948. I was completely aghast at what the religious fervor of a particular social dogma can do to the minds even of scientists.

But such fervent dogma is not limited to the communists. In this planned and controlled world, dogma could take possession of us. It could throw us into fascism or communism, government by a self-perpetuating elite. It exists even now, and has existed for a long time. I was also aghast when an intelligent young man speaking at the Forum of Labor, Agriculture and Industry, at Laramie, on behalf of a trade association serving utility companies, swinging his arms in a ministerial fervor of exhortation, damned all Americans who did not agree exactly that *he* and his stock of cliches represented the virtues of freedom, good, truth and beauty. Those who did not agree were "statists," a low form of "socialist."

He was for a controlled economy too, but the control was by a different and smaller group than most of us in America would be willing to trust.

In this world of planning and control of human affairs, where absolute truths are evaporating under the impact of scientific progress, what can we hold to? There is no completely satisfying answer. Perhaps the best we can do is be cautious of dogma and words without meaning, to do the best we can to close the gap between scientific progress and human institutions, and at all times to hold firmly before our eyes a big healthy black question mark.

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THE INHERITANCE PROCESS AS VIEWED THROUGH
THE PROBATE COURT IN DANE
COUNTY, WISCONSIN

A COOPERATIVE research project, conducted jointly by the law school and the department of agricultural economics of the University of Wisconsin, was made as an exploratory investigation of the possibilities of using probate court records as a source for research in the fields of inheritance and capital accumulation.

The master sample for this study was selected from the death certificates recorded in the Register of Deeds' office for Dane County. The death of every resident of the county is recorded there regardless of where that resident died. Only decedents who had been legal residents of Dane County and over 20 years of age on death were selected. The five years 1929, 1934, 1939, 1941, and 1944 were selected for study. A 20 percent sample of death certificates for these years yielded a master sample of 983. Pertinent information from each death certificate sampled was recorded to supplement and check the information contained in the probate court records. For instance the death certificates provide more information as to occupation, age, sex, marital status, residence on death, etc. than do the estate records. Each schedule so obtained was checked against the index of probate court proceedings to determine whether an estate had been probated for the deceased person. If a record of any such proceeding was found, the type was recorded along with the file number of the record. In cases where any doubt existed as to whether the individual named in the death certificate and the probate court index were the same person, further checks were made through comparison of information on the death certificate with that in the folder for the estate. A sample of 415 estates was drawn by this procedure. Of these, 172 were testate estates, 195 were intestate estates settled by regular probate procedure, 33 were termination of joint tenancy only, and 15 were descent of lands proceedings.¹

Only 42.2 percent of the decedents in the master sample had an estate which passed through probate court. People who were classi-

¹ In these last two types of cases relatively little formal court action is required, and as a result the folders for these estates contain considerably less information than the regular estate folders. For this reason it has not been possible to include these estates in some of the tabulations.

fied² professional or proprietors (these were considered as one occupational group) had the highest proportion of estates probated of any occupational group with 66.2 percent of all such people having an estate. Farmers ranked second with 51.4 percent leaving an estate which passed through probate court. As might be expected a smaller proportion of women left estates than did men in any of the occupational groups. Only 33.1 percent of the women left estates. Inclusion of the 149 women undoubtedly had the effect of lowering the overall proportion of people leaving an estate—just as the inclusion of the 57 professional and proprietary people had the effect of raising the proportion. If these two extreme groups were excluded, the average proportion of people who left an estate would be 45.6 percent.

As might be expected, people between the ages of 70 and 90 had the highest proportion of estates (47.2 percent) which entered probate court. People between the ages of 20 to 50 (only 10.1 percent of all the people in the master sample) had the smallest proportion (30.0 percent) of estates probated. The proportion for people from 50 to 70 was 38.4 percent and for people over 90 it was 43.3 percent. This is about the pattern one might expect, since it is between the ages of 20 and 50 that the greatest effort is required to support and educate a family. It is logical to expect that people over 90 would also be less likely to leave an estate since most people of that age have been using up past accumulations of wealth to maintain themselves.

This study indicates that few people accumulate any sizable fortunes during their lifetime; 45.3 percent of those people having an estate which passed through probate court had a net worth on death of less than \$5,000.³ For Dane County as a whole this meant that about 77 percent of the people accumulated property worth less than \$5,000 free of debt during their lifetime. Only 10 percent of the estates studied had a net worth on death of \$25,000 or more. For Dane County as a whole, this meant that only about 4.2 percent of the people accumulated property worth more than \$25,000 during their lifetime.

The average net worth on death for all estates probated was \$11,500. The presence of 13 estates with a net worth of more than

² The occupational classification used here is based on the Works Progress Admin. Circular No. 2, *Occupational Classification and Code*, 1935.

³ Net worth as it is used here, includes the face value of all insurance, tax exempt property, and "gifts made in contemplation of death." The latter term is defined by law in Wisconsin as any gift made within two years of death.

\$50,000 had the effect of raising this average figure substantially. When considered by occupational groups, the professional people and proprietors (66.2 percent of them had estates probated) was the group with the highest net worth on death with an average of \$23,868. This group also had the greatest fluctuation in average size of estate on a year to year basis, with a low average of \$4,300 in 1939, and a high average of \$50,900 in 1944. Farmers as a group ranked second in size of net worth on death (51.4 percent of them had estates probated) with an average of \$11,400. The average net worth on death for all other people (41.1 percent of them had estates probated) was \$8,784.

The most striking feature of this analysis of the size of estates is the fact that even in Dane County, which should be more prosperous than the average county, there are very few people who manage to accumulate any substantial amount of wealth during their lifetime. This simple fact provides eloquent comment on the need for old age security programs. Five thousand dollars is certainly not enough money to provide security for the old age of any individual in this day and age, yet more than 77 percent of the residents of Dane County had less than this amount when they died.

A comparison was made between farmers, professional and proprietary people, and people in other occupational groups with respect to the composition of estates. Farmers definitely appear to have a larger proportion of their assets tied up in real estate than any other occupational group. They held farm real estate equal to 45.6 percent of the net value of the estate, and urban real estate equal to 7.3 percent of the net value of the estate. Professional and proprietary people, on the other hand, have farm real estate with a value equal to 3.3 percent of the net estate and urban real estate with a value equal to 35 percent of the net estate. People in other occupations have farm real estate with a value equal to 7.3 percent of the net estate and urban real estate with a value equal to 35.7 percent of the net estate.

People with smaller estates had a larger proportion of their holdings in real estate than did people with larger estates. This tendency was evidenced in all three occupational groups. In each occupational group, for the estates with a net value of less than \$5,000, the real estate holdings were valued at more than 90 percent of their net worth.

Professional and proprietary people appeared to possess fewer liquid assets in relation to their net estates than other occupational

groups. Cash and bank deposits for this group were equal in value to only 5.7 percent of the net estate. For estates of from five to fifteen thousand dollars net worth the proportion was 10.2 percent of the net estate. This was the highest proportion noted in any size group for people in this occupation. Farmers held cash and bank deposits worth 16.8 percent of their net estate. This proportion varied from a high of 23.1 percent for farmers with a net worth on death of less than five thousand dollars to a low of 15.2 percent for farmers with a net worth on death of from twenty-five to fifty thousand dollars. People in other occupations held cash and bank deposits valued at 14.1 percent of their net worth at death, with a high of 19.2 percent for those with net estates of less than five thousand dollars and a low of 10.3 percent for those with net estates of from fifteen to twenty-five thousand dollars.

The farmers in this sample made very little use of life insurance. The average face value of such insurance was equal to only 0.4 percent of the net estate. This may indicate that farmers as a whole depend principally on their investment in the farm business to provide security for their old age and for their dependents. Professional people and proprietors carried the largest relative amount of insurance with an average value equal to 25.1 percent of the net estate. This proportion for other people was 4.4 percent. Only 16.9 percent of the people with estates carried any life insurance at all. The amount of insurance carried by these people was also very small. In 43 out of the 70 estates where life insurance was carried the value of that insurance was less than \$2,500. In only 12 out of the 70 cases was the amount of insurance over \$9,500.

The question has frequently been raised as to whether or not a "will" makes any difference in the expense or time required to settle an estate. From this study it appears that there is no consistent savings in either time or over-all expense for settling an estate with a will when estates of comparable size are compared. Administrative expenses were further analyzed to get a more precise answer to this question. Attorneys' fees for testate and intestate estates of comparable size were about the same. There did seem to be a somewhat smaller charge for the personal representative in testate estates, but other expenses involved in closing the estates were sufficiently varied between the two kinds of estates to overshadow any slight advantage deriving from the smaller payment to the personal representative.

It is of further interest to note that in 8.6 percent of the estates with wills the disposition of property was identical with that provided by law. In another 11.4 percent of such estates the disposition was *almost* identical with that provided by law.

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ECONOMICS OF MINIMUM WAGES IN RELATION TO THE AGRICULTURAL LABOR MARKET

IN A discussion in this Journal of the economic effects of a minimum wage for farm workers on agricultural welfare and employment the conclusion was drawn that employment would be curtailed and agricultural poverty would be increased if a minimum wage were imposed.¹ It was suggested, first, that a minimum wage would result in higher labor costs, resulting in the "less intensive operation of . . . farm enterprises" and some curtailment of output. This reduction in output might be considerable in view of the fact that the farms which are responsible for the larger share of the total output are the very ones which employ wage-labor.² Secondly, there would be a tendency for farm operators to shift from the employment of hired labor to the fuller utilization of family labor or to transfer workers from the category of wage-earners to that of share-croppers.³ Thirdly, the curtailment in employment and the general inability of displaced agricultural workers to shift into other types of employment would tend to result in an even greater underemployment or unemployment in agriculture.⁴ Finally, farm operators would probably prefer hiring workers on an hourly basis rather than on a weekly or monthly basis with a corresponding drop in labor income.⁵

The conclusion that the minimum wage would result in a higher labor cost is based on the assumption that the increased costs cannot be offset by increased efficiency on the part of the workers or by an induced improvement of management techniques on the part of the employers. The argument that farm operators may

¹ Baughman, Earnest T., "A Note on Minimum Wages and Agricultural Welfare," this Journal, November 1946, pp. 1048-61.

² *Ibid.*, p. 1059.

³ *Ibid.*

⁴ *Ibid.*, p. 1060.

⁵ *Ibid.*

tend to displace hired workers in favor of family workers is based on the assumption that the impact of the minimum wage will bear substantially on farm operators who have a small wage-labor force and who find it possible to utilize such family labor. The conclusion that workers would be paid on an hourly rather than on a weekly or monthly basis also assumes that the impact of the minimum wage will be on farm operators who have a small wage labor force, for it is these farmers who generally employ workers on a monthly or weekly basis.

The analysis does not consider the possibility that certain monopsonistic (or oligopsonistic) elements may be present in the farm labor market with a possible "exploitation" of workers, i.e., a failure to pay workers the value of their marginal revenue product.⁶ In addition, though it points to possible greater agricultural poverty of the workers because of their immobility, it does not question whether such immobility may also not provide opportunities for "exploitation." To the extent to which such exploitation may exist, the imposition of a minimum wage should have little employment effects. Finally, the analysis does not distinguish between short-run and long-run effects and does not consider certain dynamic factors which may well tend to offset any unemployment effects of a minimum wage.

In this note an attempt will be made first, to discuss the reality of the assumptions and secondly, to indicate the extent to which the condition of "exploitation" may exist in agriculture.

It should be said at the outset, however, that no attempt is made in this note to arrive at a judgment "on balance" of the minimum wage in agriculture. It is proposed only to point to factors, overlooked in the reference article, which are believed relevant to empirical studies necessary to policy decisions in this perplexing field.

Substitutability of farm labor. To what extent will the introduction of a minimum wage in agriculture result in the displacement of farm workers because of higher labor costs? In answering this question two factors must be taken into consideration: the extent to which labor costs represent a small or large proportion of total costs; and the degree to which the employers may have been employing the best management or administrative procedures.

It has been pointed out that the substitution effect of the im-

⁶ This definition of exploitation follows that of Chamberlin, E. H., *Theory of Monopolistic Competition* (5th Ed.), pp. 182 ff.

position of a minimum wage may well be offset by certain other factors, such as increased productivity on the part of workers (because of the higher wages) or increased productivity as a result of employers' efforts. Increased productivity of the latter type may result from either the use of other resources (which may result in some drop in employment only if costs rise) or the adoption of management techniques which were previously available but not utilized. That is, the employers are "shocked out of lethargy." If an industry has a relatively low labor cost, the opportunities for improved management will usually be present.⁷

An analysis of wage costs in agriculture indicates that agriculture may well be an industry of low labor costs. In 1946, for example, the wages of farm labor represented about 18 percent of total production expenses.⁸ There is reason to believe that the imposition of a minimum wage may result in "shocking" some farm employers into improved methods of production.

If firms have been sheltered "from the full rigor of competition" and if they have been producing over a "prolonged period of rising business activity" one might well expect a certain degree of "administrative laxity."⁹ Both elements have been present in agriculture for the past years and it might well be that there is room for certain management adjustments. Such adjustments may result either in greater output with the same labor force or may even result in less work. But it may well be that the decrease in the number of man-hours required to complete one farm operation, due to improved organization, will yield the same income and no change in agricultural workers' poverty. Indeed, in agriculture, it may bring about the displacement of children and some women. Such displacement, rather than increasing agricultural poverty, may improve the welfare of this labor group.¹⁰

In certain areas, exploitative wages, if they exist (see below), may simply maintain inefficient farm operators. The imposition of a minimum wage may drive these growers out of business. But in the long run more capable men may replace them and the unemployment effects can be nil.¹¹

⁷ Stigler, George J., "The Economics of Minimum Wage Legislation," *American Economic Review*, June 1946, pp. 358, 359.

⁸ U. S. Department of Agriculture, *Agricultural Statistics* 1947, p. 536.

⁹ Reynolds, Lloyd G., "Toward a Short Run Theory of Wages," *American Economic Review*, Vol. 38, No. 3, June 1948, p. 298.

¹⁰ Dobb, Maurice, *Wages*, 1938, p. 131.

¹¹ Pigou, A. C., *Essays in Applied Economics*, pp. 50-51.

The substitution effects of the establishment of an agricultural minimum wage are not obvious. There are many considerations which must be taken into account, and such wage action, if reasonable, may not have any significant unemployment effects.

Displacement of hired workers by family workers. Although there may be a tendency to replace hired wage workers by family workers if an agricultural minimum wage were introduced, the amount of such replacement will depend, *inter alia*, upon the extent to which the smaller family-size farms employ wage workers.

In 1939 only 4.5 percent of the country's 6.1 million farms, or about 266,000 farms, were responsible for over 54 percent of the 1939 cash farm-wage bill. These farms accounted for only 5.6 percent of all family farm workers employed during 1939. For the United States as a whole almost two-thirds of the farm-wage bill in 1939 represented wages paid to workers hired by the day or week, or piece work and contract work.¹²

These data would seem to indicate that the displacement may not be substantial. And if the minimum wage legislation were applicable only to farms which employed, say, over four farm workers, the problem vanishes.

Wage-fixing combinations of farm employers. The lack of competition among farmers as buyers of labor and the existence of wage-fixing combinations among farm employers may put such employers in a position to "exploit" the farm workers.¹³ Such exploitation will take place if, in addition, the demand for workers is inelastic in the "market period."

If the demand for workers in the "market period" is such that there is a limit to the number of workers which can be hired the marginal revenue product curve would be indeterminate at this point. If the wage set by the wage-fixing combination is below this point, exploitation exists

The extent to which agricultural employers have combined as buyers of labor in order to depress wages below their competitive levels is not easily demonstrable chiefly because such information is seldom publicized. However, the hearings and reports of the

¹² Ducoff, Louis J., *Wages of Agricultural Labor in the United States*, U.S. Department of Agriculture, Technical Bulletin No. 895, July 1945, pp. 10, 12-13, and 29.

¹³ Machlup, Fritz, "Monopolistic Wage Determination as a Part of the General Problem of Monopoly," in *Proceedings of the Chamber of Commerce of the United States on Wage Determination and the Economics of Liberalism*, January 11, 1947, p. 56.

La Follette Committee on the farm labor situation offer considerable evidence that such combinations do exist in the California agricultural labor market and other areas.¹⁴

The La Follette Committee reported that the wages prevailing in many areas of agricultural production in California "are not customarily the result of collective bargaining procedures. Instead, they are subject to considerable employer control exercised on a uniform basis to avoid the effects of competition for or a local scarcity of labor."¹⁵ The "employers . . . are usually members of an association which has as one of its purposes the execution of policies respecting labor and labor relations. . . . They are concerned, among other things, with labor supply, the setting and adjusting of wage rates, and, more recently, with the questions of employee association, collective bargaining, and labor legislation."¹⁶

The La Follette Committee points out that these associations grew in number with the development of the wage-labor system. Typical of these associations are the Agricultural Labor Bureau of the San Joaquin Valley, the Farm Labor Service in Arizona, the Western Growers Protective Association, the Grower-Shipper Vegetable Association, the California Fruit Growers Exchange and the local exchanges associated with it, and the California Processors and Growers, Inc.¹⁷

It is interesting to note that "the groups of employers who meet to fix wage rates are usually organized and led by the large employers." The President of the Associated Farmers of California, Inc., stated that "we frequently find the large operators set the wage scales and he (sic) is the one that does actually create the wage scale and it is usually followed by the smaller farmers."¹⁸

There is evidence that growers in other states have banded together to fix wages. For example the wages of berry and apple pickers in the Puyallup Valley and Yakima and Wenatchee valleys were for many years set by the fruit growers associations. Evidence before the Tolan Committee indicates that Florida bean growers have met to establish a picking price.¹⁹

¹⁴ Senate Committee on Education and Labor, 77th Congress, Second Session, Reports on *Employers' Associations and Collective Bargaining in California*, 1942.

¹⁵ *Op. cit.*, Part 3, p. 181.

¹⁶ *Op. cit.*, Part 4, p. 408. The concern of the employers is not to encourage "employee associations, collective bargaining, and labor legislation" but rather to discourage them.

¹⁷ *Ibid.*, pp. 409-410.

¹⁸ *Ibid.*

¹⁹ Schwartz, Harry, *Seasonal Farm Labor in the United States*, p. 71.

Admittedly the evidence of employer wage-determination is sparse. But there are certain basic social, economic and institutional conditions which would seem to require such employer combinations. Farmers may fear, because of social ostracism, to set wages above the level of those set by their neighbors.

On the economic side it must be recognized that in the "market period" or short run the labor costs are strategic and, therefore, the farmers attempt to keep wages as low as possible. This problem is most acute in the harvest of fruits and vegetables since picking cannot be postponed. Furthermore, of all costs which growers must meet, the wage cost is more susceptible to individual grower decisions.²⁰ For these reasons the farmers seek, either through collective wage determination or the creation of large labor supplies, to keep the wages low.

The existence of local Farm Bureau or Farm Grange organizations and the development of cooperative marketing and shipping organizations provide the institutional framework within which growers can meet annually to set the wage rate jointly.

The bargaining position of the farm worker. Wherever employer wage-fixing combinations exist today one will usually find the employees organized. This, however, is not the case in the farm labor market. Not only are the farm workers disorganized, but the conditions of employer-employee relationships are such as to give the farm operator an opportunity to "exploit" the farm worker. And whatever attempts have been made by farm workers to organize have been resisted and, in some instances interfered with, by farm operators.

Although there have been many attempts to organize farm workers, such organizations have been "sporadic, scattered, and short-lived."²¹ The factors which have made the organization of these workers difficult have been economic, social, and political. "Their extreme mobility, the high seasonality of their work, and the low wage rates all combined to make unionization among them costly and, at the same time, created chronic problems for the communities in which they lived. The social status of seasonal farm workers was that of a lower caste, suffering poverty, depending upon relief, and lacking adequate facilities for education, housing, sani-

²⁰ Schwartz, Harry, *op. cit.*, pp. 68, 69.

²¹ United States Department of Labor, Bureau of Labor Statistics, Bulletin No. 836, *Labor Unionism in American Agriculture*, p. 406.

tation, and medical attention. They were, on the whole, politically impotent and, in many states, disfranchised."²²

Under such conditions, there are reasonable grounds for concluding that exploitation will take place since the organized farm employer has a greater strategic strength in bargaining with his workers. In the first place, he is accustomed to bargaining with workers. Secondly, the superior financial condition of the employer offers him an opportunity to resist the wage demands of the worker. On the other hand, the inferior financial status of the workers may reduce their mobility, lacking funds to seek alternative employment. And if wage setting by oligopsonistic combinations exists throughout a large agricultural area, even with funds, workers would have little basis for seeking other jobs. Finally, if a worker happens to be a tenant—or a member of a tenant's family—of the farmer, his failure to accept the offered wage may result in his displacement from the farm.²³ The latter problem is particularly acute in the southern part of the United States where a large portion of the seasonal farm labor force consists of this type of labor.

On balance, then, the bargaining strength of the growers appears to be much greater than that of the farm workers, and, on the basis of the social, economic, and political conditions surrounding the wage bargain, it would be reasonable to assume that a certain degree of "exploitation" exists.

Immobility of farm workers. It has been stated that "probably the strongest case for the creation of labor monopolies to avoid monopsonistic wage determination" may be made when (1) "many labor markets are geographically or occupationally so isolated that employers have no competition in their purchase of labor" or when (2) "chronic unemployment makes employed labor practically immobile and eliminates employers' competition for labor."²⁴ Thus, the immobility of the workers offers the wage-fixing combination an opportunity to push the wage below the marginal revenue product.

One must distinguish between two groups of seasonal farm labor, namely, the local resident group and the transient, migratory workers. In many cotton areas of the South is found the first type. Each year wives and children of tenant farmers or sharecroppers

²² *Ibid.*

²³ Pigou, A. C., *The Economics of Welfare* (3rd ed.), Macmillan and Co., p. 559.

²⁴ Machlup, *op. cit.*, pp. 56, 58-59.

are employed in the cotton harvest and at the end of the farm operation they leave the labor market. The latter group consists of workers who travel from area to area in search of work and are employed to meet the requirements of the seasonal peaks.

The local, resident seasonal worker is, of course, highly immobile. He is poor in financial resources and unable to move to other areas (particularly in the short-run); the social ties to his home and family are strong; and he is usually ignorant of other employment opportunities. Fear of displacement as a tenant or sharecropper will usually prevent him from "bargaining" for higher wages. And in instances when this local resident, seasonal worker has demanded, or was in a position to demand, higher wages, the growers have advertised for and brought in workers from other areas to maintain wages at the "going rate."²⁵

During the past war period farmers pursued a number of policies in order to preserve their farm labor supply.²⁶ High license fees for labor recruiting agents, special deferment provisions for farm workers under the Selective Service Act, and the provision under the Farm Labor Transportation Program that no workers were to be recruited in any county for work in other areas without prior approval of the county agent who must certify that the county had a surplus of labor are examples of methods employed to "freeze" workers in their areas of usual employment.

The transient, migratory worker who moves from crop to crop would appear at first to be highly mobile. He is, until he reaches the place of employment. Employers have used a variety of devices to bring into the area a "surplus" of labor. Such devices have included the flooding of areas with handbills, local newspaper advertising, radio broadcasts, etc., with the subsequent disorganization of the farm labor market.²⁷ Once the workers have arrived at the area of "need," they have no alternative but to accept the wage offer.

The economic factor here too plays an important role in forcing growers to adopt such practices. In view of the need for maintaining control over the wage, only a surplus of workers could continue

²⁵ See Report of Select Committee on *Interstate Migration*, House Report No. 369, 77th Congress, 1st Session, pp. 364 ff., for many illustrations of this practice. (Hereafter referred to as the Tolan Committee Report.)

²⁶ Kaufman, Jacob J., "Farm Labor During World War II," this Journal, February 1949, pp. 131 ff

²⁷ Tolan Committee Report, p. 364 ff.

such control. Once workers are employed various devices are used to prevent them from "skipping" to other jobs. For example, "bonuses" (actually, "holdbacks") are paid to workers provided they stay on until the harvest is completed; or credit is extended to workers so that they are in debt at the beginning of the harvest and must remain on the farm until the end of the season in order to pay off the debt.²⁸

Short Run vs. Long Run Effects. The short run substitution effects of a minimum wage in agriculture may be considerably limited. Particularly in the harvesting of such crops as fruits, vegetables, and cotton (so far) there are few substitutes for hand labor. "Tractors can't work between tightly packed rows and the machine that can harvest broccoli and egg plant and tomatoes has yet to be built."²⁹

The substitution effect may, rather, be one of a long-run nature, but in the long run dynamic factors may play an important role.³⁰ "Over any substantial period of time there are such pronounced changes in productivity, consumer preference, and the general condition of business that the relationship (i.e., between the imposition of a minimum wage and the curtailment of output and employment) is fatally beclouded."³¹

Conclusions

There is some evidence that "exploitation" may exist in agriculture as a result of combinations of employers for the purpose of wage-fixing, and of a considerable degree of labor immobility. Although the evidence of such wage-fixing combinations is limited, certain social and economic forces are at work and certain institutional structures exist which make such combinations necessary (from the point of view of the farmer) and possible. The immobility of workers is not only the result of the political, social, and economic environment of the workers, but also of the direct activities of the growers themselves. To the extent that these two elements—oligopsony and labor immobility—exist in the farm labor market the imposition of a minimum wage may be justified in order to wipe out the existing "exploitation" without any unemployment

²⁸ U. S. Department of Agriculture, *Backgrounds of the War Farm Labor Problem*, May 1942 (mimeographed), pp. 101-102.

²⁹ McWilliams, Carey, *It Fares the Land*, Faber and Faber Ltd., p. 137.

³⁰ Reynolds, Lloyd G., *op. cit.*, p. 300.

³¹ Ross, Arthur M., *Trade Union Wage Policy*, p. 79.

effects. In other words the competitive solution is not applicable under these conditions.

Furthermore, there is some basis for questioning the substitution effects, even under competitive conditions, of the imposition of a minimum wage for agricultural workers. And, in some instances, such substitution (if it does take place) may not necessarily increase agricultural poverty. The possible elimination of women and children from the farm labor market and the displacement of inefficient farmers may have certain desirable economic effects.

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SOME PROBABLE EFFECTS OF TAXATION ON FARMERS' MARKETING PRACTICES*

DURING the last decade farmers in the United States experienced a period of high-level production and relatively high commodity prices. This combination of favorable circumstances resulted in the highest level of farm incomes in the history of American agriculture. Although incomes were not uniform throughout the farming area over this entire period, in general, total farm production, prices, and incomes have been consistently high since 1941. Paralleling the price and income situation during this period has been a consistent tendency to broaden the income-tax base and to increase tax rates. This combination of circumstances has brought about a phenomenal increase in farmers' tax contributions to the Federal Government.

The purpose of this article is to explore the hypothesis that specific phases of Federal tax policies and administrative procedures influence farmers' marketing practices. It is essential first to present certain background information.

In 1913 the 16th Amendment to the Constitution of the United States was adopted permitting Congress to levy income taxes "without apportionment among the several States, and without regard to any census or enumeration." Because of liberal personal exemptions (\$4,000 for married couples) the Federal income tax in the early years 1913 to 1917 touched farmers' incomes to only a minor extent. Tax rates at that time were modest, the "normal"

* This paper represents the author's personal views on the subject under discussion.

tax in 1913 being one percent with no surtax until taxable income passed \$20,000. It was not until the high price and income years following World War I that the income tax assumed any importance in the business affairs of farmers.

From 1921 to 1940, the number of farmers paying Federal income taxes and the amounts paid were still of only minor significance. In fact, as late as 1939, according to the Bureau of Internal Revenue's classification of returns by industries or types of businesses, only about 140,000 businesses were listed in the farming category.¹

Beginning with 1940, substantial increases in Federal tax obligations were effected by merely lowering personal exemptions. Returns for 1941 contained over a million in the farm group. Changes in the revenue code from 1941 through 1943 imposing higher rates and lowering personal and dependency exemptions brought many farmers into the income-tax-paying fraternity for the first time.

Although no tabulations are available as to the number of farmers reporting for the latest tax years, estimates have been made of the amount of taxes paid. Based on available data relating to income distribution and tax payments for sample groups of farmers, the Bureau of Agricultural Economics has estimated that Federal income-tax payments of farmers during the last few years were as follows:²

<i>Year Paid</i>	<i>Amount</i>	<i>Year Paid</i>	<i>Amount</i>
1941	\$ 15,000,000	1945	\$725,000,000
1942	50,000,000	1946	720,000,000
1943	425,000,000	1947	760,000,000
1944	275,000,000	1948	960,000,000

The question arises, in what manner does the frequency and amounts of farmers' income-tax payments influence their marketing schedules and practices. One clue to an answer to this question lies in the method of accounting for or, more appropriately, methods of reporting incomes for tax purposes. Under the present code a farmer may use either the cash or accrual basis for reporting income.

Basically, the cash method allows a business firm, for tax-reporting purposes, to include all cash income actually or constructively received and to deduct all allowable expenses paid out during

¹ Isaac, G. J., "Farmers Taxes," *Agr. Finance Rev.* BAE Vol. 9, Nov. 1946, p. 12.

² *Agr. Finance Rev.* BAE Vol. 11, Nov. 1948, p. 90.

the tax year, regardless of the time the income was earned or the expenses were incurred. In actual practice it is estimated that 90 percent of the farmers who file income tax returns use the cash method of reporting.

The accrual basis is really an inventory method of reporting income. Income reported on the accrual basis includes all income earned during the taxable year from sales made in that year, regardless of when payment is received.³ In addition, increases in inventory values at the end of the year compared with the beginning of the year must be included. Allowable expenses include all business operating costs incurred during the year, whether paid or not, and any decrease in inventory values at the end of the year compared with the beginning of the year.

Obviously, the accrual method of reporting requires a more detailed and complex system of bookkeeping than the cash method. Some few farmers find it advantageous (tax-wise) to use the accrual method, but the vast majority find the cash method more desirable. It is important at certain times for this large segment of cash-reporting farmers to act or to forego action on specific dates within the year. For example, tax obligations may be materially altered by the execution of a sale or delay of execution for a period of as little as 24 hours.

During 1946 and 1947 there was much public discussion of the probability of Federal tax reduction legislation. Perhaps anticipating a lower tax rate in 1947 some farmers carried over their 1946 crops and sold them in 1947. Important tax reductions did not, however, materialize in 1947. Farmers who had carried over and sold their crop in 1947 found themselves in the embarrassing position at the close of the calendar year of having another bountiful crop on hand to be disposed of at exceptionally favorable prices and pay income taxes accordingly, or run the risk of carrying the new crop over into another year. If the farmer sold his 1947 crop (having carried all or substantially all of the 1946 crop over), he would be thrown into a higher income tax bracket and, in effect, would be forced into paying a higher rate of tax in that year on two years' income.

With each new income bracket present surtax rates increase

³ Tax Court cases have introduced many refinements as to when and how it may be determined that income has been received. Rulings on specific cases, however cannot be considered as having any general applicability.

significantly. In contrast to the four-percent rate in effect in 1917 on taxable incomes in excess of \$2,000 and a surtax rate of only one percent on incomes from \$5,000 to \$7,500 the present basic tax is \$400 plus 22 percent of the excess over \$2,000. To appreciate the tax significance of income increments of two, four, six, and ten thousand dollars it is necessary again only to review a sample of the schedule of rates in the Bureau of Internal Revenue's 1948 information pamphlet, "How to Prepare Your U.S. Income Tax Return." Excerpts from the 1948 Federal Income Tax Rate Schedule

Over \$ 2,000 but not over \$ 4,000—\$ 400, plus 22% of excess over \$ 2,000
Over \$ 4,000 but not over \$ 6,000—\$ 1,260, plus 30% of excess over \$ 4,000
Over \$ 6,000 but not over \$ 8,000—\$ 1,860, plus 38% of excess over \$ 6,000
Over \$ 8,000 but not over \$ 10,000—\$ 2,640, plus 46% of excess over \$ 8,000
Over \$ 10,000 but not over \$ 12,000—\$ 3,400, plus 54% of excess over \$ 10,000
Over \$ 12,000 but not over \$ 14,000—\$ 4,240, plus 62% of excess over \$ 12,000
Over \$ 14,000 but not over \$ 16,000—\$ 5,060, plus 70% of excess over \$ 14,000
Over \$ 16,000 but not over \$ 18,000—\$ 5,860, plus 78% of excess over \$ 16,000
Over \$ 18,000 but not over \$ 20,000—\$ 6,640, plus 86% of excess over \$ 18,000
Over \$ 20,000 but not over \$ 22,000—\$ 7,400, plus 94% of excess over \$ 20,000
Over \$ 22,000 but not over \$ 24,000—\$ 8,140, plus 102% of excess over \$ 22,000
Over \$ 24,000 but not over \$ 26,000—\$ 8,860, plus 110% of excess over \$ 24,000
Over \$ 26,000 but not over \$ 28,000—\$ 9,560, plus 118% of excess over \$ 26,000
Over \$ 28,000 but not over \$ 30,000—\$ 10,240, plus 126% of excess over \$ 28,000
Over \$ 30,000 but not over \$ 32,000—\$ 10,900, plus 134% of excess over \$ 30,000
Over \$ 32,000 but not over \$ 34,000—\$ 11,540, plus 142% of excess over \$ 32,000
Over \$ 34,000 but not over \$ 36,000—\$ 12,160, plus 150% of excess over \$ 34,000
Over \$ 36,000 but not over \$ 38,000—\$ 12,760, plus 158% of excess over \$ 36,000
Over \$ 38,000 but not over \$ 40,000—\$ 13,340, plus 166% of excess over \$ 38,000
Over \$ 40,000 but not over \$ 42,000—\$ 13,900, plus 174% of excess over \$ 40,000
Over \$ 42,000 but not over \$ 44,000—\$ 14,440, plus 182% of excess over \$ 42,000
Over \$ 44,000 but not over \$ 46,000—\$ 14,960, plus 190% of excess over \$ 44,000
Over \$ 46,000 but not over \$ 48,000—\$ 15,460, plus 198% of excess over \$ 46,000
Over \$ 48,000 but not over \$ 50,000—\$ 15,940, plus 206% of excess over \$ 48,000
Over \$ 50,000 but not over \$ 52,000—\$ 16,400, plus 214% of excess over \$ 50,000
Over \$ 52,000 but not over \$ 54,000—\$ 16,840, plus 222% of excess over \$ 52,000
Over \$ 54,000 but not over \$ 56,000—\$ 17,260, plus 230% of excess over \$ 54,000
Over \$ 56,000 but not over \$ 58,000—\$ 17,660, plus 238% of excess over \$ 56,000
Over \$ 58,000 but not over \$ 60,000—\$ 18,040, plus 246% of excess over \$ 58,000
Over \$ 60,000 but not over \$ 62,000—\$ 18,400, plus 254% of excess over \$ 60,000
Over \$ 62,000 but not over \$ 64,000—\$ 18,740, plus 262% of excess over \$ 62,000
Over \$ 64,000 but not over \$ 66,000—\$ 19,060, plus 270% of excess over \$ 64,000
Over \$ 66,000 but not over \$ 68,000—\$ 19,360, plus 278% of excess over \$ 66,000
Over \$ 68,000 but not over \$ 70,000—\$ 19,640, plus 286% of excess over \$ 68,000
Over \$ 70,000 but not over \$ 72,000—\$ 19,900, plus 294% of excess over \$ 70,000
Over \$ 72,000 but not over \$ 74,000—\$ 20,140, plus 302% of excess over \$ 72,000
Over \$ 74,000 but not over \$ 76,000—\$ 20,360, plus 310% of excess over \$ 74,000
Over \$ 76,000 but not over \$ 78,000—\$ 20,560, plus 318% of excess over \$ 76,000
Over \$ 78,000 but not over \$ 80,000—\$ 20,740, plus 326% of excess over \$ 78,000
Over \$ 80,000 but not over \$ 82,000—\$ 20,900, plus 334% of excess over \$ 80,000
Over \$ 82,000 but not over \$ 84,000—\$ 21,040, plus 342% of excess over \$ 82,000
Over \$ 84,000 but not over \$ 86,000—\$ 21,160, plus 350% of excess over \$ 84,000
Over \$ 86,000 but not over \$ 88,000—\$ 21,260, plus 358% of excess over \$ 86,000
Over \$ 88,000 but not over \$ 90,000—\$ 21,340, plus 366% of excess over \$ 88,000
Over \$ 90,000 but not over \$ 92,000—\$ 21,400, plus 374% of excess over \$ 90,000
Over \$ 92,000 but not over \$ 94,000—\$ 21,440, plus 382% of excess over \$ 92,000
Over \$ 94,000 but not over \$ 96,000—\$ 21,460, plus 390% of excess over \$ 94,000
Over \$ 96,000 but not over \$ 98,000—\$ 21,460, plus 398% of excess over \$ 96,000
Over \$ 98,000 but not over \$ 100,000—\$ 21,440, plus 406% of excess over \$ 98,000
Over \$ 100,000 but not over \$ 150,000—\$ 67,820, plus 89% of excess over \$ 100,000

Rates go as high as 91 percent on bracketed incomes in excess of \$200,000 but relatively few farmers are concerned with rates applicable to incomes above the \$100,000 level. In the event that receipts from sale of two crops have to be accounted for in the same tax year, a considerable number of farmers would have incomes above the \$100,000 figure but in proportion to the total number of income-tax paying farmers the percentage in this group would still be very low. Prevailing high prices, high-level production and high tax rates of recent years have tended to make farmers more accounting conscious. The increasing surtax rates on the higher income brackets are a strong inducement to equalize incomes between years as nearly as possible.

In the absence of primary supporting data, determination of the specific degree of importance to attach to the influence of income tax considerations on farmers' marketing decisions is not within the purview of this paper. Such an attempt would have to be approached through a lengthy process of establishing statistical models which would make possible weighting of the dominant motivating forces that influence farmers' marketing practices or patterns. There is, however, strong evidence to indicate that income tax considerations do enter into farmers' marketing decisions. The following table, illustrative of data compiled on important grain crops, shows that for the last three crop years larger than average movements of wheat from farm to market took place during the month of January. Again it should be pointed out here that

TABLE 1. WHEAT: MONTHLY SALES BY FARMERS—
1947 CROP WITH COMPARISONS

	June	July	Aug	Sept.	Oct.	Nov	Dec.	Jan	Feb.	Mar	Apr.	May	June
United States	Percentage of Total Sales												
1945-46	6.1	22.7	18.4	10.2	8.6	4.8	3.6	8.1	3.2	2.0	1.7	9.3	1.3
1946-47	10.1	18.8	18.5	10.2	6.9	5.8	5.1	10.4	6.6	5.1	2.8	3.2	1.5
1947-48	6.7	23.7	16.2	10.5	7.7	4.3	3.4	6.5	3.5	3.5	5.1	5.9	3.0
1935-36 to 1944-45*	5.6	23.0	14.8	10.4	7.2	4.8	5.3	5.2	5.0	5.6	5.6	4.4	3.1

Source: Crop Reporting Board, Bureau of Agricultural Economics.

* (10 year average).

the great majority of farmers use the calendar-year basis for tax-reporting purposes.

There are no doubt several factors that contribute to the deviation from the general pattern of wheat sales in the month of January. It is difficult to trace the significance of any single motivating factor, but by the process of elimination certain of the factors generally considered to be determining influences may be dismissed.

For the grain crops price, storage, and feed considerations are generally recognized as primary influences affecting farmers' marketing decisions. These three considerations do not, however, appear to be paramount during the time period which is, from the tax consideration standpoint, crucial. It can be assumed that in most instances the storage problem has been resolved by the month of January, thus eliminating this factor as an important influence on sales in January of each of the calendar years considered.

Grain held over for feed purposes is not customarily disposed of until some rather tangible indications of crop prospects for the en-

TABLE 2. WEIGHTED AVERAGE PRICE PER BUSHEL OF REPORTED CASH
SALES, SELECTED MONTHS—1945-1948

	1945		1946		1947		1948
<i>Wheat</i>	<i>Dec.</i>	<i>Jan.</i>	<i>Dec.</i>	<i>Jan.</i>	<i>Dec.</i>	<i>Jan.</i>	
Hard red spring	\$1.72	\$1.73	\$2.22	\$2.21	\$3.16	\$3.22	
Durum	1.75	1.75	2.27	2.22	3.11	3.18	
Red durum	1.64	1.63	2.06	2.09	2.93	2.92	
Hard red winter	1.69	1.69	2.07	2.09	2.99	3.01	
Soft red winter	1.72	1.76	2.22	2.26	3.03	3.08	
All classes and grades ¹	1.71	1.72	2.17	2.18	3.11	3.15	

BAE—Crops and Markets, Vol. 24, No. 1, Jan. 1947; Vol. 25, Jan. 1948. Data for Jan. 1948 from unpublished records.

¹ Six markets: Chicago, Minneapolis, Kansas City, St. Louis, Duluth, and Omaha.

suings year are in evidence. There are few indications of prospects for the new crop as early as January.

It does not appear that fluctuations in prices between the months shown in Table 2 were significant enough to have had any appreciable influence in shaping farmers' decisions to sell in the first month (January) of each of the three new calendar years as compared with the previous month of the closing year. In fact, the theory is often advanced that farmers are inclined to sell on a declining market. The foregoing price figures show, in the case of wheat, that prices were tending upward in the first month (January) of the three years shown. Concern over prices, therefore, could hardly be the cause of the relatively heavy sales of wheat in the month of January.

Conclusions

The hypothesis that Federal income tax policies influence marketing decisions of farmers has not yet been adequately explored to determine the actual degree of importance. But every avenue thus far explored indicates that they do influence the marketing process. Although considerable hearsay evidence could be offered in support of the hypothesis, final judgment must await further evidence. It is hoped that this working hypothesis and the general interest exhibited in proposed research to study the problem in detail will lead to a complete analysis of the role of taxation in the marketing and distribution system.

To the extent that adjustments in the marketing program of an individual farmer or group of farmers for tax consideration purposes have a stabilizing influence on farm incomes, such adjustments might be considered highly desirable. It is, however, quite improbable that any net stabilizing influence will be gained from such practices.

Although other motivating forces may predominantly govern the marketing decisions of farmers, recent progress in developing storage facilities for both staple and certain perishable commodities lends increasing importance to the "tax angle" in the market place.

SAMUEL L. CROCKETT

LONG-TIME ECONOMIC PROSPECTS FOR
AGRICULTURE?

HAVE agricultural economists in their outlook and price policy work in recent years given sufficient attention to the possibility that we are developing new powerful factors in our economy which may modify the usual postwar behavior of prices? They may also modify greatly the usual business cycle over the next several decades. In his recent book, *Money, Debt, and Economic Activity*, A. G. Hart finds in the government's role of adjudicating conflict between the centers of great political-economic power—corporations, labor unions and organized agriculture—a strong and persistent inflationary pressure. Arguing that government price-wage policy is subject to claims from these three powerful groups, and that any controls of the prices of their particular commodities or services are very unpalatable to each, Hart contends that legislators will naturally look for the easy way out. This they will find to be in yielding a little to each group. "Farmers may want to see lower wages, but will always accept higher farm prices instead. Trade-unionists would like food cheaper, but can be consoled with higher wages. Businessmen would like both sets of prices lower, but are cheerful as long as they can add what they regard as suitable profit margins to the costs originating in wages and raw material prices. Thus, the politician has a perpetual temptation to please one group by helping its selling prices rise and then to compensate others by doing the same for them. The result is 'log-rolling inflation.'"¹

Discussing the same general problem, Calvin B. Hoover writes, "With all organizations of claimants for shares of the national income demanding incomes higher than those which can be granted out of real national income, the temptation to grant everybody larger shares—and to depend upon reducing the shares to tolerable proportions through allowing rises in the general price level—becomes terrifically great."² This pressure, he contends, grows out of the political necessity of any party, either of the "left" or of the "right," to maintain reasonably "full employment" at any cost. Keynes found a "built in" tendency of the economy to over-save

¹ Hart, A. G., *Money, Debt, and Economic Activity*, Prentice-Hall, New York, 1948, p. 480.

² Hoover, Calvin B., "Keynes and the Economic System," *The Journal of Political Economy*, LVI, No. 5 (Oct 1948) p. 401.

(in relation to investment) as the economy passed from the self-regulatory stage of effective competition to that of widespread corporate organization. But this unbalance is now in prospect of being reversed as a consequence of the increased proportion of total economic activity now being channelled through government. Not only are legislators naturally induced to pressure the price-level upward as a means of resolving industrial conflict, but also obliged, if they wish to stay in power, to overspend in relation to savings in order to maintain "full employment." The consequence: "the 'inflationary gap' is more likely to be a continuing problem for our present modified form of capitalism than is the (prewar) discrepancy between the propensity to save and the inducement to invest."² To the analyses of these two economists should, of course, be added the influences on our economy of our emphasized world leadership and the continuing "cold war."

Most long-term outlook and price policy proposals for agriculture have been fabricated upon a presumption of recurring periods of general deflation; their objectives have been principally to protect farmers against undue hardship during these periods. One wonders how long-time outlook statements should be modified and what kind of analyses and proposals in the price policy field would be appropriate should a future such as these two men foresee become a reality. One wonders also just how much exploring of this question has been done, just in case the conclusions of these men *might* be right!

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² *Ibid.*, p. 402.

LEGISLATION PASSED BY THE 81ST CONGRESS, 1ST SESSION

LAWS OF INTEREST TO AGRICULTURAL ECONOMISTS LISTED IN CHRONOLOGICAL ORDER

PUBLIC LAW 11 (S. 548) EXPORT CONTROL ACT OF 1949 (approved February 26, 1949). Continues export-control authority until June 30, 1951, or such earlier date as Congress or the President may determine. Provides that controls shall not be exercised on agricultural commodities during any period for which the

supply is determined by USDA to be in excess of domestic requirements.

Public Law 28 (H.R. 128) COTTON ACREAGE ALLOTMENTS (approved March 29, 1949). Amends the AAA Act of 1938 so as to provide that state, county, and farm acreage allotments and yields for cotton for any year after 1949 shall be computed without regard to yields or to the acreage planted to cotton in 1949.

Public Law 38 (H.R. 2101) RACC DISASTER LOANS (approved April 6, 1949). Abolishes the Regional Agricultural Credit Corporation and transfers its functions to the Secretary of Agriculture. Authorizes the Secretary to make loans to farmers and stockmen for any agricultural purpose in any area or region where he finds that a production disaster has caused a need for agricultural credit not readily available from other responsible sources.

Public Law 47 (S. 1209) ECA AUTHORIZATION (approved April 19, 1949). Among other things, provides that 12½ percent of wheat shipments from the United States shall be in the form of flour; amends the provision regarding surplus agricultural products so as to provide that a "class, type, or specification" of a commodity may be determined by the Secretary to be surplus.

Public Law 85 (S. 900) COMMODITY CREDIT CORPORATION CHARTER ACT AMENDMENTS (approved June 7, 1949). Amends the Commodity Credit Corporation Charter Act in the following respects: Returns CCC to the supervision and direction of the Secretary. Increases the number of members of the Board of Directors from five to seven. Provides that the Secretary serve as Chairman of the Board. Removes the limitation upon the appointment of directors who are otherwise employees of the Federal Government; provides for a bi-partisan advisory board of five members.

It permits the Corporation to acquire real property or any interest therein for the purpose of providing storage adequate to carry out effectively and efficiently any of the Corporation's programs.

Public Law 99 (H.R. 3181) WATER FACILITIES LOANS (approved June 10, 1949). Increases from \$50,000 to \$100,000 the monetary limitation on individual projects which may be undertaken under the Water Facilities Act of 1937.

Public Law 155 (H.R. 5240) FATS, OILS, RICE IMPORT CONTROLS (approved July 1, 1949). Amends the Second War Powers Act, 1942, so as to continue until July 1, 1950, the authority for exercis-

ing, administering, and enforcing of import controls with respect to fats and oils and rice and rice products.

Public Law 171 (S. 1070) **HOUSING ACT OF 1949** (approved July 15, 1949). Authorizes the Secretary, through the Farmers Home Administration, to make loans, for a period up to 33 years and at not over 4 percent interest, to owners of adequate farms who are otherwise unable to finance safe and sanitary housing and other needed farm building improvements for themselves or others working on the farms. The loans will not require a first mortgage on the farm property and may be secured by the farmers' equity in the farms. Authorizes similar loans, supplemented by annual contributions, to owners whose farms are not presently adequate, but which may be brought to an adequate basis through a satisfactory program of enlargement. Authorizes combination loans and grants for minor improvements and repairs to farm dwellings and farm buildings, in order to make them sanitary and safe, on farms which are neither adequate nor potentially adequate. Title IV authorizes a program of technical research and studies on housing.

Public Law 268 (H.R. 3825) **FEDERAL CROP INSURANCE ACT AMENDMENTS** (approved August 25, 1949). Authorizes an increase each year in the number of counties in which insurance can be offered. Removes the clause requiring indemnities to be paid on a pro-rata reduced basis, beginning with the crop year 1950, when indemnities exceed premiums.

Public Law 272 (S. 1962) **COTTON ACREAGE ALLOTMENTS AND MARKETING QUOTAS** (approved August 29, 1949). Authorizes the proclamation of a national marketing quota for cotton whenever the total supply exceeds the normal supply, as defined in the act. Provides for the proclamation of a national acreage allotment which will produce the amount of the proclaimed quota. For 1950 and 1951 special provision is made for the distribution of the national acreage allotments to states and counties. Contains provisions relating to wheat and peanuts to provide for certain minimum farm wheat acreage allotments for 1950 and for a minimum national peanut acreage allotment for 1950 of 2,100,000 acres. Provision is also made for the apportionment of the national peanut acreage allotment in 1951, and thereafter, by increasing or decreasing 1950 state acreage allotments proportionately as the national allotment is increased or decreased.

Public Law 307 (H.R. 1211). **TRADE AGREEMENTS** (approved

September 26, 1949). Repeals the Trade Agreements Extension Act of 1948 and extends the Trade Agreements Act until June 12, 1951, in substantially the same form as before the 1948 amendments.

Public Law 352 (S. 2116) **PUBLIC WORKS** (approved October 13, 1949). Authorizes the appropriation of \$100,000,000 for advances by GSA to the States for advance planning of non-Federal public works.

Public Law 348 (S.J. Res. 53) **REFORESTATION AND REVEGETATION** (approved October 11, 1949). Declares the policy of Congress to accelerate and provide a continuing basis for reforestation and revegetation of forest lands. Authorizes for reforestation and revegetation through the Forest Service appropriation of \$4,500,000 for fiscal year 1951, increasing to \$13,000,000 in 1955.

Public Law 361 (H.R. 2514) **FINANCIAL ASSISTANCE TO HOMESTEAD ENTRYMEN** (approved October 19, 1949). Permits the extension of loan assistance under the Bankhead-Jones Farm Tenant Act and the act of August 28, 1937, known as the Water Facilities Act, to persons who are acquiring farms by means of homestead entry on public lands or who are purchasing farms on reclamation projects, and who are otherwise eligible for such loans.

*Acts Passed by Both Houses of Congress But Not Yet
Signed by the President as of October 24, 1949*

H.R. 2960. **LOANS FOR RURAL TELEPHONES**. Authorizes the Administrator of the Rural Electrification Administration to make loans for the purpose of financing the improvement, expansion, construction, acquisition, and operation of facilities to render telephone service in rural areas. The loans will bear interest at 2 percent and are subject to the same terms and conditions as loans made for rural electrification.

H.R. 4146. **NATIONAL MILITARY ESTABLISHMENT APPROPRIATION FOR 1950**. Carries the following provisions: That none of the funds appropriated in this title shall be used for the payment of any subsidy on agricultural or other products; the Secretary of the Army is authorized to purchase from the CCC any food products owned and stored by such Corporation which the Secretary determines to be of a satisfactory quality for the use of the Military Establishment, or for civilian feeding in occupied areas.

H.R. 2296. **COOPERATIVE FORESTRY PROGRAMS BILL**. Amends

the Clarke-McNary Act so as to increase funds for forest fire protection from \$9,000,000 to \$20,000,000 by successive yearly increases, and increases the yearly appropriation authorization for growing forest tree planting stock from \$100,000 to \$2,500,000 by successive annual increases; expands the Federal-State education program for small forest landowners by increasing the annual appropriation authorization to \$500,000.

H.R. 5856—FAIR LABOR STANDARDS ACT OF 1949—Raises minimum wages of covered workers to 75 cents an hour.

H.R. 6305—INTERNATIONAL WHEAT AGREEMENT ACT OF 1949—The President is authorized, acting through the CCC, to make available or cause to be made available, such quantities of wheat and wheat flour and at such prices as are necessary to fulfill the obligations of the United States under the International Wheat Agreement of 1949.

H.R. 3699—FEDERAL LAND-BANK LOANS—Amends the Federal Farm Loan Act to authorize loans through National Farm-Loan Association in Puerto Rico, to increase the limitations on Federal Land-Bank loans to any one borrower from \$50,000 to \$100,000.

H.R. 5345—AGRICULTURAL ACT OF 1949—Provides price supports at 90 percent of parity if acreage allotments or quotas are in effect for basic commodities in 1950; at 80 to 90 percent in 1951; and 75 to 90 percent in 1952 and thereafter.

Whole milk, butterfat, and the products of such commodities are to be supported at between 75 percent and 90 percent of parity. Price supports for wool, including mohair, tung nuts, honey, and Irish potatoes are mandatory between 60 and 90 percent of parity. Price support for non-basic agricultural commodities, other than the designated commodities, is permissive at any level not in excess of 90 percent of parity.

The modernized parity formula contained in the Agricultural Act of 1948 is amended to include wartime subsidy payments and wages paid hired farm labor. However, in the case of the basic commodities, the use of the old parity price definition is required at any time during the four year period beginning January 1, 1950, if that price is higher than the modernized parity.

The Secretary is directed, so far as practicable, to announce the level of price support for field crops in advance of the planting season and for other agricultural commodities in advance of the beginning of the marketing year or season.

BOOK REVIEWS

Readings on Agricultural Policy, Edited by O. B. Jesness, Univ. of Minnesota. The Blakiston Co., Philadelphia. 1949. Pp. xi, 470, \$4.50.

Readings on Agricultural Policy is a collection of previously published articles dealing with various phases of agricultural policy. A good job has been done. This book consists of twenty-three papers by twenty-one different individuals and eleven articles from committee reports. It is definitely not a textbook, but can be a valuable reference for students of economics and agricultural economics—especially those taking courses in agricultural policy.

The book is divided into four parts: (1) Background, (2) Price and Production Adjustments, (3) International Trade and Relations, (4) Land and Rural People. In a collection of published articles on closely related topics, there is naturally considerable repetition due to each writer presenting background material for his major points. No attempt will be made to evaluate or summarize the contents of the various articles.

Part 1 presents background material on agricultural policy. It contains five papers and takes up about one-eighth of the book. The first two papers contain fundamental material dealing with the relationship of agriculture to the national economy. The next deals with farm prosperity, followed by a paper on what farmers want. The concluding paper of this section stresses the importance of the general welfare approach in developing agricultural policy.

This section does not include a presentation on world agriculture, the nature of farming in other lands, the extent to which it is carried on by peasants, and the broad aspects of agricultural policy in other nations. A paper dealing with these broad aspects would be helpful in orienting the thinking of students studying our own agricultural policy.

Part 2, dealing with price and production adjustments, contains fifteen papers and takes up nearly one-half of the book. This section starts out with a history, written in sympathetic vein, of the development of agricultural policy since World War I. This is followed by a paper on the evolution of parity. Several of the papers in this section discuss various aspects of parity. Over half the articles in Part 2 were parts of reports on agricultural price policy by various committees, including the Committee on Postwar Agricultural Policy of the Association of Land Grant Colleges and Universities,

various committees of the Farm Economic Association, and the House Special Committee on Postwar Economic Policy and Planning of the seventy-ninth Congress. In the main, these reports deal with the general aspect of price and production policy. Other articles in this section present individual opinions on the fundamentals of a sound agricultural price policy and, in some cases, their suggested solutions to the problems involved.

The selection of papers to be included for this section was no doubt difficult in order to present a fair balance between those in the profession who have considerable faith in government programs and those who do not share this view. From an over-all point of view, this section might have been strengthened if more analysis had been presented on the demand approach—such things as the Stamp Plan, School Lunch, Relief Feeding, Animal Agriculture, and the like.

Part 3 contains five papers dealing with international trade and relations. It starts out with a paper on the United States and World Trade, which is followed by a discussion of reconciling agricultural and foreign trade policies. The remaining papers deal, to a considerable extent, with a proposed World Trade Board and with commodity agreements.

This section contains too much on commodity agreements and not enough on fundamentals of trade. There was not enough discussion on the place and responsibilities of the United States in foreign affairs, the dollar shortage, our need to develop imports, and the like. The editors had to select from things written. Here again, perhaps, is a case where too little has been written on fundamentals in proportion to writings on specific programs of action.

Part 4 deals with land and rural people. It contains nine papers. The need for a land policy was discussed, followed by a broad presentation dealing with our major land use problems, and a paper on issues in federal land management in the western states. The section contains papers on land tenure, problems of farm laborers and share croppers, the problems of southern agriculture and concludes with a presentation on rural living and social facilities.

Three things impressed the reviewer from reading these articles concurrently: First, most economists were too pessimistic on farm prices for the immediate postwar period. Second, most economists discuss and attack parity as if it were the actual price received by

farmers. History indicates that the market price received by farmers and the calculated parity price for a product are two different things. Third, there is almost uniform criticism of production control. Few, if any, point out its most glaring weakness; namely, "In most cases it didn't work." If, by controls, the price of corn had been stabilized at a "reasonable" level, perhaps many economic arguments would have been advanced for production controls.

Much could—and probably will be—written on what the editor should have included or omitted. Nothing is to be gained from such a procedure since the volume is already published and wise selections have been made. It is of some concern, however, that so little appeared in the *Readings on Agricultural Policy* on the role that research and education has played in the development of American agriculture. After all, the contribution of our national policy regarding agricultural education and research should not be overlooked.

Some of the articles are a little out of date due to the fact that postwar conditions are somewhat different than anticipated by the writers. The question might be raised if the Association's next step might be to attempt a "policy" book by inviting people to write chapters on definite and assigned topics for a joint publication.

This book, *Readings on Agricultural Policy*, is well worth reading by persons interested in any phase of public policy.

T. K. COWDEN

Michigan State College

The Consumer and the Economic Order, by Warren C. Waite and Ralph Cassady, Jr. New York: McGraw-Hill, 1949. Pp. x, 440. \$4.50.

When this volume first appeared in 1939—a modernized and extended version of Professor Waite's *Economics of Consumption* published in 1928—its reception by reviewers was generally favorable. As a text to service the growing number of college courses which were attempting to approach economics from the consumers' point of view, there was much in the book to recommend it. It was systematic, the mild "welfare" tone offered something of an antidote to the producer oriented curricula of Schools of Business, and there was repeated considerable traditional analysis which students were likely to have missed or to have forgotten from the *Principles* course.

The present edition is not substantially changed. Statistical tables and institutional data have been brought up to date in so far as possible. Reliable information on the world cooperative movements mostly ends with 1939. Chapter VI, "Competition, Monopoly and the Consumer," has been expanded on the basis of the TNEC reports and certain other studies in this area. The over-all length, including the index, has been increased by 51 pages. Here and there the analysis has been tightened up to make space for some of the events that have crowded the last 10 years.

Thus, the virtues of the earlier edition are still present. But so are the shortcomings. And these latter are the more glaring in the light of changes that have taken place, not only in the *real world* but in economic thought as well. In their preface the authors note that, "The ten years that have passed since the first edition of this book have been a period of tremendous change. These changes have emphasized the deep concern of the consumer in the operation of the economic order." Yet, one is scarcely made aware what those changes are. The name of Keynes does not even appear in the index.

While considerable space is devoted to the effect of price changes on consumers, there is practically no mention of changing levels of national income as such. It is certainly very arguable that, despite an inordinate concern over prices and shortages, consumers generally (if such there be) have fared better during these past 10 years than they ever did before in any comparable period, despite the luxury of carrying on a war and supporting a sizeable portion of the European population. There is reason to doubt that, in a return to the "good old days" of low prices, they will fare as well in the next 10, but these doubts are not raised in the present book.

The role of savings is treated only as an aspect of the individual security problem. And on page 412, the following statement appears, "The saved funds are spent as surely as expenditures made by consumers on shoes or flour." Surely, no attempt to treat the "importance of consumers" can lay claim to adequacy if it ignores completely the "new economics." To argue that it is mistaken may be one thing; to act as though it had never happened quite another.

There is a fairly extended treatment of tariffs, but one looks in vain for a reference to FAO, to the employment act of 1946 and its implications—good or bad. Assuming there is no correct answer as to the significance of these matters of more recent concern, ought they not at least be discussed?

Finally, no mention is made of the work of Katona and his associates in the surveys of consumer intentions to spend, of their liquid holdings, and the other basic data being compiled under the sponsorship of the Federal Reserve Board. Even though this work is still in its infancy—having started in 1945—it does offer at the present time some prospect for injecting the fresh air of empiricism into economics, as well as an approach to greater cooperation among the social sciences.

ALVIN E. COONS

Ohio State University

Controlling Factors in Economic Development, Harold G. Moulton. Washington, D. C.: The Brookings Institution, 1949. Pp. viii, 397, \$4.00.

This book is an analysis of "the factors which impede and restrict, and those which generate and promote, economic advancement." Because of the positive conclusions reached and since they represent the mature views of the head of one of the leading institutions of economic research, this study is a major contribution to the literature on economic progress.

Part I is an effort to draw lessons from the past. The remarkable increases in human productivity, population and standards of living since the early part of the 19th century are reviewed. The early classical economists did not foresee such advances because their analysis contemplated diminishing returns from capital with a consequent trend toward a static state. They overlooked two types of developments which have made it an exceedingly dynamic state in which the returns from capital have increased because of their steadily improving efficiency. One development has been improvements in science and technology. Such advances in agriculture, mining, creative chemistry, power, and size of enterprises have been revolutionary in their effect upon productive efficiency. These advances, however, have been facilitated by improvements in economic organization. The corporation, bank credit, and the development of stable fiscal and monetary systems have provided an environment in which free enterprisers could utilize these advances effectively.

Economic expansion, however, has not been unimpeded. It has been irregular partly because of recurring business depressions. The various explanations for these depressions are considered by

the author and the conclusion reached that each cycle has its own peculiarities and that "there is no single cause of economic disorders."

Another restricting factor is the difficulty of maintaining a market for what can be produced. Consumption is limited more by the lop-sided distribution of incomes than by traditional propensities to consume as explained by Keynes. Budget studies show that consumption increases with income though not proportionally. Concentration of income in a small percentage of consumers results in limited consumption for the masses, and high consumption and savings for the few. The rate of savings has not been the governing factor in the rates of capital formation and the output of consumer's goods. The restricting influences rather have been the amounts and distribution of income.

This approach holds no brief for the mature economy conception as developed in the discussions of the Temporary National Economic Committee. If the income pattern is right, consumption will not be held back by any fixed habits. Production will keep pace as consumption expands. The problems of disappearance of frontiers and stagnation of private investment have not materialized.

In Part II the look is forward. The author's first step in considering the future is to set up a series of major economic goals of the American people as follows:

1. A progressively larger total national income
2. A progressively wider division of national income
3. A society in which individual rewards are based primarily on work performed
4. Increasing economic security
5. Greatest possible development of the capacities of every individual
6. Opportunity for every capable individual to earn his own income

A free enterprise system, with the government exercising appropriate regulatory and control functions, is found to be the environment most conducive to achieving these goals. Full development cannot be attained under communism, State socialism, or a hybrid arrangement.

He then raises the question whether so far as natural resources and productive capacity are concerned, the United States within 100 years might support a population double that of the present

on a plane of living eight times as high as the present. Assuming a distribution of income similar to the present, this would involve multiplying expenditures for food and nutrition about eight times, shelter and home maintenance sixteen times, and similar but higher increases for other categories of expenditures. While not inconsistent with past trends, these assumed rates were established somewhat arbitrarily for the sole purpose of testing "the adequacy of basic resources by setting a very high goal." He examines the resources for each category and concludes that *as potentials* they are reasonable.

In the case of food and nutrition, the eight-fold increase involves tripling the food supply and accounting for the balance in improved quality and diversity of foods and higher processing and servicing costs. The tripling of the food supply can be brought about by reclamation, conservation, improvements of varieties and production methods, use of more fertilizers, soil-less food production, and other similar developments. Some agricultural scientists may question the feasibility of tripling the food output in the United States, even though it only involves continuing for 100 years the actual rates of increase during the last 25 years. What may be more startling, however, is his statement that such expansion would not involve diminishing returns.

Certain conditions must prevail, of course, if such potentials are to be realized. (1) Natural resources must be used efficiently. (2) Productivity per man-hour must continue to rise. This involves adequate incentives so that improved technology will be encouraged. (3) Large scale enterprises must be permitted. (4) Monetary and fiscal stability must be maintained. (5) There must be progressive expansion of mass purchasing power.

The latter requirement can be attained most effectively by transmitting the benefits of increasing efficiency through price reductions. This diffuses the benefits to all classes of consumers. If prices are maintained by support programs, wage increases or high profits, the benefits are confined to certain groups. Future markets thus may be narrowed because millions of other consumers actually may suffer a loss in purchasing power. The increasing competition of groups for economic power makes the problem of diffusing purchasing power to the masses more difficult.

The retarding effect of business depressions upon economic progress can be mitigated but not eliminated, in his opinion. A final requirement is peace and international stability. Under such

conditions, economic progress can be achieved throughout the world through the same principles as outlined for the United States.

Few of the ideas and data in this book are new. The basic philosophy was presented in four earlier studies of Brookings Institution: *America's Capacity to Produce*, 1934; *America's Capacity to Consume*, 1934; *The Formation of Capital*, 1935; and *Income and Economic Progress*, 1935. Various points also have been included in other publications of the author and of Brookings Institution. It should be recognized also that some of the findings have been the subject of controversial discussion among economists.

The merit of this book is that it brings together in compact form a well-rounded theory of economic progress, supported by long years of research and study. This experience is reflected also in the clear, forceful style, and logical sequence in the presentation of the material.

R. C. ENGBERG

Farm Credit Administration

Commodity Exchanges and Futures Trading, Julius B. Baer and Olin Glenn Saxon. New York: Harper and Brothers, 1949. Pp. xii, 324. \$5.00.

Following very closely the treatment in *Commodity Exchanges* (Baer and Woodruff, 1935), of which this edition is a revision, the subject of futures markets and exchange operations is broken down into four major categories: historical development, organization and marketing functions, speculation and hedging, and the legal aspects of contracts, clearing houses and the Commodity Exchange Act.

The material relating to the law and organization of commodity exchanges and clearing houses and the discussion of the Commodity Exchange Act is well organized and reflects a first-hand experience of long standing with the technical-legal workings of the exchanges. Throughout the entire book, moreover, the authors have managed to convey their ideas in a simple, almost popular style—a difficult feat to accomplish when applied to such controversial and technical subject-matter.

The handling of the economic aspects of futures market operations perhaps overemphasizes the role of the exchanges insofar as they are presented as being "vital to a free economy"; at the same time, the book underemphasizes the limitations and abuses of futures trading operations. While the authors did not intend to

undertake "an extensive analytical or theoretical treatise . . .", questions relating to the benefits of speculation, the extent of price manipulation and price determination, and similar questions touched on in this book require just such treatment before valid and reliable answers can be obtained. No original analytical contributions have been made by the authors and the scanty quantitative analyses which are presented are based on data referring to pre-War I conditions and, in some cases, to conditions before the turn of the century. No indication is given, moreover, that the authors have considered the statistical data which have become available since 1935 or the more recent advances in economic theory which do not lean so heavily on purely competitive assumptions. This book would have given a more balanced economic presentation had it incorporated the more recent analyses to be found in such publications, among others, as: Blau, G. "Some Aspects of the Theory of Futures Trading," *Review of Economic Studies*, 1944-45; Howell, L. D., "Analysis of Hedging and Other Operations in Grain Futures," United States Department of Agriculture, 1948; Keynes, J. M., "The Policy of Government Storage of Foodstuffs and Raw Materials," *Economic Journal*, 1938; Irwin, H. S., "Middlemen's Accumulations and Expectations in Marketing Farm Products," this *Journal*, 1947; Hoffman, G. W., "Grain Prices and the Futures Market—A Fifteen Year Survey, 1923-1938," United States Department of Agriculture, 1941; and Lerner, A. P., *Economics of Control*, 1946, Chapter 8—"Competitive Speculation." These references in their respective order have been chosen at random to cover one or another point at issue but not discussed as such in the book—the difference between the insurance principle and risk bearing on commodity exchanges, the extent to which hedging is not a perfect risk bearing device, the relation of futures markets to market concentration and accumulation, types of abnormal price and market conditions, and the concept of counter-speculation.

While a descriptive treatment of the existing institutional workings of the exchanges does not necessarily require it, the economic analysis would be more meaningful if some consideration had been given to a comparison of the relative merits of the integrated firm, various systems of forward pricing, and other alternatives to the futures markets as a means of transferring or reducing risks in the marketing of agricultural commodities.

HERMAN L. MYERS

Bureau of Agricultural Economics

Agriculture and Industrialization: The Adjustments That Take Place as an Agricultural Country Is Industrialized, Pei-kang Chang.
Cambridge: Harvard University Press, 1949. Pp. xiv, 270. \$5.00

In this book the author, Professor of economics at Wuhan University, seeks to examine the theoretical, empirical and historical aspects of "the adjustments between agriculture and industry during the process of industrialization" with particular attention to the adjustments within agriculture itself (p. 1). At the outset he proposes four questions for special study: (1) Is industrial development a necessary or a sufficient condition for agricultural reform in a densely populated rural region, or *vice versa*? (2) Is it possible to maintain a balance between agriculture and industry within a given country? (3) Is it possible to maintain harmonies and mutually beneficial relations between countries primarily agricultural and those essentially industrial? (4) What are the particularly pressing problems which would most probably confront an agricultural country during its process of industrialization?

In answering these highly important and ambitious questions within the rather modest length of this book, Professor Chang's principal contribution proves to be largely that of summarizing and synthesizing the many-sided literature of the field. His bibliography is extensive and will be helpful to all who are interested in problems of industrialization and economic progress. He makes clear that so broad an analysis must depend upon the whole gamut of economic theory—general- and partial-equilibrium, imperfect competition, location, production, national income, business cycles, capitalist development, and interregional and international trade. That he is able to review rather satisfactorily so great a range of theoretical literature and to indicate, in each case, its relevance to his problem is an impressive demonstration of his comprehensive economic training and his professional versatility. However, the over-all result is unfortunately an excess of superficiality and pedantry. For example, is it still necessary to define at length such concepts as the price and income elasticities of demand and the elasticity of substitution (pp. 30-36 and 131)? The theoretical and empirical parts of the book—neither of which demonstrates much originality on the author's part—are not very well integrated. The empirical data, for the most part, will be familiar to most American readers, either because they describe well-known trends within the United States or because they are from such standard international sources as Colin Clark's investigations.

Several errors might be noted. The first footnote on Page 66 incorrectly expresses the mathematical forms of the "Cobb-Douglas formula." On Page 120 (line 9 et seq.) the analysis of the initial effects of a technological improvement upon the perfectly-competitive firms first adopting it (Fig. 3) is wrong in supposing that these firms' sales would be limited to the old equilibrium volume OA. Instead, taking the new (lower) marginal-cost curve into account, their output would for a time exceed even the new long-run equilibrium volume OB. Finally, it surely cannot be true (pp. 211-12) that "... the prices of the [Danish] exports of agricultural products have been relatively unaffected by cyclical fluctuations of business. . . ."

The most original and interesting part of Professor Chang's book is Chapter VI, in which he briefly applies his analysis to Chinese industrialization. Having now clearly shown his broad knowledge of the general theoretical and empirical literature of his field, Professor Chang should be encouraged to devote his future research efforts to an expansion of his investigations of the problems of industrializing his own important country. Economists throughout the world would await his findings in this area with great interest and anticipation.

WILLIAM H. NICHOLLS

Vanderbilt University

The Economic Problems of Forestry in the Appalachian Region,
William A. Duerr. Cambridge: Harvard University Press, 1949.
Pp. x, 308. \$5 00.

The five states of Kentucky, North Carolina, Tennessee, Virginia and West Virginia are chosen to represent the Appalachian Region. The total area included in these five states is then subdivided into five "physiographic" provinces as follows: (1) Coastal Plain, (2) Piedmont, (3) Highlands, (4) Great Valley and (5) Interior province. The author also calls these provinces "forestry" provinces, "not because they have been delineated with special reference to the forestry situation, but because they are believed to conform in general to the broad geographic pattern of forestry conditions in the region and will be used in describing and analyzing these conditions."

The first chapter of the book contains a scholarly discussion of many economic and social data summarized according to the above-

named forest provinces. Anyone interested in this arrangement of data will find this chapter helpful.

The second chapter deals with problems of people and the land, with special emphasis on the people of the Highlands and the Piedmont. More use is made of state data. The significance of custom and tradition is emphasized.

The third chapter is concerned with problems of forest-land management such as ownership, tax-delinquency, taxation, fire, etc. The fourth chapter discusses timber management practices and the economic characteristics of timber as a crop.

The next five chapters are devoted to marketing problems. In the opinion of this reviewer, the most interesting chapter in the book is Chapter VII, which describes problems in marketing pulpwood. The discussion of the "contractor system" and its abuses reads like the work of one who knows what he is writing about.

The book ends with a chapter on the consumption of forest products in which a plan for the consumption of forest products is identified with a plan for harvesting. Estimates of growth and drain of timber are given. The key idea that gives form to this chapter is the notion that "It is necessary to compare consumption, not with standing timber, but with the ideal consumption under some rational plan, before it can be ascertained whether problems exist." A balance between growth and drain seems to be the ideal or rational plan.

Among the many ideas the reader will get from this book, two are especially significant: (1) the large percentage of total forest products represented by fuel wood, and (2) the preponderance of farm and other small private holdings of forest land.

As the story unfolds, the use made of the physiographic or forest provinces becomes progressively less; and unless one has read the preface and the 27 pages of introductory material, he might begin to wonder whether the purpose of the volume was merely to discuss the economic problems of forestry in the Appalachian region as the title suggests.

Much of this introductory material undoubtedly helped the author in his very practical problem of working out requirements for the Ph.D. at Harvard, but so far as the public is concerned the book would have been much better if it had begun with Chapter I and had omitted all the confusion about the definition of economics and the field of forest economics. The hedonistic or pleasure-pain

conception of economics is only one view; and the notion of economics as a "link between things and people" rather than as relations between people and people leaves much to be desired. Just why engineering is classed as a "naturalistic" science is left unexplained.

If the book is to be regarded as "a definition of forestry economics" rather than mainly as a discussion of some of the economic problems of private forestry in the Appalachian region, the author has given too little attention to the public economics of forestry. Although public forestry is mentioned, and even though it is conceded that public and private interests in forest land management may not always be in harmony, little use is made of these observations to give public ownership and management of forest lands, as well as public regulation of privately owned forests an increasingly important place in a "rational plan."

Various passages in the book show the author to be no blind devotee of rampant free enterprise, but he has not given sufficient emphasis to the fact that forestry economics includes public action to deal with the anti-social consequences of forest land ownership in fee simple—consequences he clearly recognized.

BUSHROD W. ALLIN

Bureau of Agricultural Economics

The United States International Timber Trade in the Pacific Area,
Ivan M. Elchibegoff. Stanford: Stanford University Press,
1949. Pp. xvii, 302. \$7.50.

At this stage in world history when the United States is shifting into a dominant international role, and our foreign trade position is a matter of great importance, exports and imports of timber take on a new significance; particularly when our supplies of exportable timber are shrinking and dollar-short nations hope to pay for some of their purchases here with raw or semi-manufactured forest products. Dr. I. M. Elchibegoff's contribution on timber trade in the Pacific is particularly timely.

Although timber has not been a large part of the Pacific foreign trade in terms of dollar value (14.3 percent), it is significant that slightly more than 50 percent of the shipping space in 1936 was utilized by forest products. The author points out further that the 26 countries in the Pacific area exported a total of 3.8 billion board feet of logs and lumber while importing 2.9 billion feet. A surplus

for shipment outside of the Pacific zone was thus made available.

This book is divided into three parts, the first of which deals with introductory material and definitions. Trade terminology and the classes of woods are discussed in terms of supply and demand by each nation in the Pacific area. Significance of the timber trade in relation to all world trade is treated in considerable detail.

Part Two deals with the forest resources both in terms of supply and past production of each of the 26 forested nations bordering the Pacific. Separate chapters complete with tables, not only cover the forest areas and resulting products therefrom, but also population and agricultural statistics. Maps showing the distribution of each forest area are included. Dr. Elchibegoff has drawn his data from all readily available sources—much of which is especially sketchy because adequate forest inventories have never been undertaken; or they are incomplete and partially available. Some are held in secret. The author has brought together under one cover some very revealing data on the Pacific forests of the U.S.S.R. as well as Manchuria. This volume will serve as a ready reference on the forest statistics for all countries bordering the Pacific along with such material as is presently available through FAO. A useful addition would be a general map of the Pacific area as a means of orienting the reader to the individual maps shown for each nation.

A great many tables covering population, crop production, land use, etc. are included both in Part Two and in the Appendix. Other than the fact that these serve as a basis for determining available labor supply and internal consumption of forest products, their significance to foreign trade is not made entirely clear. So much of this sort of material is included as to obscure the really important facts which can be gained from the population-resource ratios.

In Part Three the author undertakes to analyze and assess the implication of each nation's foreign trade policies and economic factors influencing trade. Technical trends in wood uses come in for examination, particularly in relation to the pulp and paper industry of the United States and Japan. Production costs, prices and transportation factors in the United States are treated descriptively, but unfortunately very little comparable data have been presented for other nations. In the case of tariff policies and their effect on the volume of import and export trade, better comparisons are presented for the major trading countries. For example, the disastrous effect of the Hawley-Smoot Act of 1930 on United,

States West Coast lumber exports is demonstrated in the greater than proportional drop in volume which the Reciprocal Trade Agreements failed to restore.

Since the beginning of World War II the United States has been a net importer of lumber—a drastic shift in our historical position. Unfortunately, the author fails to probe this situation in the detail it warrants, particularly since stumpage supplies available for future export are no longer abundant. The West Coast of the United States has always consumed a large quantity of imported tropical hardwoods. With an increasing shortage of high grade North American furniture woods the opportunities for greater importation from the tropics are opening up. Peeler logs used by the West Coast plywood industry are likewise in short supply due to timber depletion. Opportunities for importation of large tropical logs for this purpose are present, and one wishes the author had placed more emphasis on these shifts which are already in the wind.

Except for a few technical errors this volume can be criticized principally for its limited scope rather than content itself. One looks in vain for some treatment of the structure and institutions actually performing the foreign trade in timber products. Answers to such questions as profit margins or brokerage commissions and distribution and uses of product are not treated. Although the author treats most of the Pacific countries in as great detail as data permits, huge forest areas such as New Guinea and the large island groups of the South Pacific are not covered.

Perhaps too much emphasis is given to the fact that the United States has been an exporter of softwood lumber in the past. Development of new chemically derived products from wood in addition to paper is in the offing and it is conceivable that this may become a far more important item than it is possible to forecast at present. Nevertheless, lumber requirements both for repair of war damage and improving housing standards will comprise the great bulk of demand for timber in the foreseeable future, as the author points out.

Several minor technical errors in the use of the term "sulfite" in place of "sulfate" (p. 194) and *vice versa* on page 198 change considerably the implication of the author's forecasts in relation to the Southern and Alaskan pulp industries. This reviewer finds it difficult to believe that plant expansion in these two regions will supplant imports of duty-free Canadian newsprint. The power

of the press will continue to be exerted in behalf of duty-free imported newsprint in the future as it has in the past. Nowhere in the Continental United States and only in limited Alaskan areas is it possible to find the combination of spruce and abundant water power needed to make a large expansion in newsprint production. Canada holds the key to this situation.

Although the author has carefully stayed within the limits of the traditional pattern of foreign trade as it has been carried on within the past, a very useful purpose would be served if he had indulged in some quantitative forecasting. Two factors which are already beginning to show themselves could change foreign trade relationships considerably. Political stability in China under almost any conceivable regime will very probably result in a very slight improvement in living standards, if only because less energy is spent in war. This slight rise would reflect itself in an increased demand for housing and hence lumber of very large proportions.

The other unknown, of course, is Russia's entry into foreign trade on a much larger scale than at present. Elchibegoff's data on Russian Pacific timber supplies show some very large quantities available. If these are made available to the world market very considerable shifts in past trade trends would take place. Both of these prognostications depend upon shifting political winds which are very difficult to forecast. Yet the large potential demand and supply areas can be measured quantitatively and their effect evaluated if they should become active participants in foreign trade. Although prognostications of this nature could never be made with any degree of finality they would serve the useful purpose of preparing policy-makers with a set of alternatives which could develop in the future. It would thus enable the United States and other nations in the world to adapt themselves to the various eventualities which actually will develop.

Elchibegoff has made a useful contribution to forest economics literature. He has assembled material from nearly every available source and focussed it into an important trade area. Since forestry literature is almost wholly lacking in texts on foreign trade in forest products, this book will be welcomed as a distinct contribution to the field and will find considerable demand by students, teachers, economists and persons engaged in international trade.

CHARLES H. STODDARD

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Theories of Welfare Economics, Hla Myint. Cambridge: Harvard University Press (for the London School of Economics and Political Science), 1948. Pp. xiv, 240. \$4.00.

This book does more than its title suggests. It contains both a clear, concise summary of modern welfare economics and a refreshingly accurate interpretation of classical economics. It is a history of economic thought that rightly devotes more than half its pages to the period since John Stuart Mill. It defines welfare economics at once so broadly as to include the main body of all economic theory, and so narrowly as to exclude (because it involves unscientific interpersonal comparisons of utility) the problem of the distribution of personal incomes. The book is a critical summary of each major theoretical system that deals with increasing welfare through production and exchange.

In Part I, "Physical Level," Professor Myint views the classical writers. Their primary concern was not the allocation of given resources (this view is a "theoretical anthropomorphism" of the modern day), but increasing the total physical output by raising the physical productivity of labor and expanding the total volume of economic activity. Hence their dynamic laws of population and capital accumulation. Free Competition was intended to promote dynamic expansion by giving free rein to individual initiative (quite different from today's pure and perfect competition, intended to secure allocative efficiency).

The great controversy between Malthus and the Ricardians over the balance of production and consumption here assumes its rightful place. Professor Myint has a brilliant analysis of the measure of value problem. This neglected element in classical economics was an integral part of the Glut controversy. Keynes' measurement of the national income in wage-units is, after all, the equivalent of Malthus' use of labor commanded. Second only to this as a specific contribution is his sympathetic interpretation of Productive Labour.

On details of interpretation there are bound to be differences of opinion. Not seeking a typical case, let me pause with Malthus. Professor Myint's generally excellent treatment is based on the second edition of Malthus' *Principles*. Reference to the first edition would have shown that Malthus' use of the intensity of demand was independent of (and prior to) Senior's "path-breaking work" on marginal utility (cf. Myint, p. 36). Furthermore, Malthus' *Measure*

of *Value* (1823) shows that the distinction between "extrinsic" and "intrinsic" value was not borrowed from Senior. Only the labels were borrowed (*cf.* Myint, p. 38). Again, Malthus' emphasis on the "intensity of demand" did not reduce entirely to purchasing power, for he stressed the *will* as well as the power to purchase, and emphasized that the maintenance of effective demand required that the commodities produced be suited to the tastes of consumers (*cf.* Myint, pp. 37-38, 64).

Part II, "Subjective Level," concerns the marginalist writers. Allocation of resources, in the full sense of adaptation of products to consumers' wants, is now the dominant theme. Diminishing marginal utility or substitutability replaces the assumption that quantities of welfare are roughly proportional to quantities of physical products, while given resources are assumed rather than augmentable ones.

There are excellent brief summaries of the General Equilibrium school, with their general optimum defined in terms of equality between subjective and technical marginal rates of substitution, and the English Neo-classical school, with their stress on exceptions to the principle of competition and their techniques of surplus analysis and comparison of marginal social product with marginal private product. Each type of analysis has its place, Professor Myint feels, but the surplus analysis promises most for practical use.

Part III, "Ethical Level," considers those criticisms of conventional theory that object to its assumption of constant wants. Yet conventional theory remains useful, Professor Myint believes: consumers' demand is relatively stable at any given moment of time and scientific impartiality must be sought. However, the broader problems of general social welfare on the ethical level cannot be ignored. We must make value judgments when dealing with practical social policy, but we should do it consciously and deliberately.

VICTOR E. SMITH

Michigan State College

Grass Silage and Dairying, Ray W. Ingham in Association with Willis A. King, Walter C. Russell and Carl B. Bender, New Brunswick, Rutgers University Press, 1949. Pp. vii, 88.

The New Jersey Agricultural Experiment Station has been one

of the pioneers in grass silage research, especially in its chemical and engineering aspects, since the early 30's. The brief volume under review covers, among other things, the results of a five-year feeding study carried out by the Station with partial support from the Herman Frasch Foundation for Chemical Research. It purports to present to "the less specialized reader" a "clear and balanced picture of the nutrient values of the more familiar grass silages and the effects of those silages on the milking cow and her output."

It does present some useful data on feeding value, and physiological effects of silages of (1) molasses-alfalfa vs. phosphoric acid-alfalfa, (2) molasses-oats vs. phosphoric acid-oats, (3) molasses-soybean vs. corn meal-soy bean, (4) molasses-grass vs. ground barley-timothy, (5) molasses-timothy vs. ground barley-timothy. In all of these tests cows were matched for productive ability, and corn silage was used as the control.

The authors follow a line of reasoning apparently designed to prove that dairy farmers throughout the humid part of the country should put up grass silage, and preserve it with molasses. Barn drying is dismissed with a single sentence: "Although in mow cured hay they [nutrient losses] are much less, the cost of special equipment . . . can be prohibitive." (p. 17)

Corn meal used as a preservative, while showing up well in production is not favored because "... ground grains are expensive in some sections, especially when, as is often the case, they must be applied at the rate of from 200 to 250 pounds to the ton." (p. 64) Value of nutrients added is not mentioned.

Field wilting is eliminated because "'65 per cent' of included moisture is extremely difficult to gauge. Only the most experienced operator can be reasonably certain that the crop has dried just that far and no farther." The reviewer was not aware that good results by the wilting method required exactly 65 per cent moisture; he is under the impression that about 60 to 68 per cent is the permissible or optimum moisture content. A recent survey indicates that about 85 per cent of Wisconsin farmers who wilted their grass silage and did not use a preservative produced "good" or "excellent" silage.

It is unfortunate that the comparative cost data given includes nothing on field forage harvesters. There is good reason to doubt whether, without a bigger cost advantage in favor of grass silage than appears to exist, the practice of ensiling grasses by stationary

chopper will ever become general. There are too many headaches and backaches.

This small volume is already out of date as a result of the rapid adoption of the field forage harvester and the "wilting method" of making grass silage.

EDWARD J. SMITH

University of Wisconsin

NOTE TO THE MEMBERSHIP

In order to keep expenditures in line with income the Executive Committee instructed the Editor to limit the Proceedings (Part II of this issue) to 400 pages and the total size of the annual volume including four regular issues and one Proceedings Supplement to 1200 pages.

Papers at the Laramie meetings have been shortened considerably, yet the Proceedings are in excess of the limit set. Authors have been most cooperative.

The editor requests that you review the Proceedings in some detail and comment on the following:

1. Should the printing of full length papers be limited to those presented at the general meetings with only a digest printed of the papers and discussion at each of the sectional meetings?
2. Should dues be raised and all the material presented at the annual meetings be printed?
3. Should the same procedure be followed next year with more severe cutting, or should authors be given rigid limits at the time they are invited to prepare papers?

PUBLICATIONS RECEIVED

- American Country Life Association, "Rural Ideas and Rural Policies," Proceedings of the Twenty-sixth and Twenty-seventh Conference, 1947 and 1948, published 1949.
- Bloom, Leonard, and Riemer, Ruth, "Removal and Return—The Socio-Economic Effects of the War on Japanese Americans," Berkeley: University of California Press. Pp. x, 259. \$3.75.
- Food and Agricultural Organization of the United Nations, "Yearbook of Food and Agricultural Statistics," Volume I, Production, 1948, Washington, D. C., 1949. Pp. xviii, 285. \$3.50.
- *Jesness, O. B., Editor, "Readings in Agricultural Policy," Philadelphia: Blakiston, August, 1949. Pp. xi, 420. \$4.75.
- Landis, Benson Y., "Rural Welfare Services," Morningside Heights, New York: Columbia University Press, 1949. Pp. viii, 201. \$3.00.
- Meade, J. E., "Planning and the Price Mechanism," New York: Macmillan Company, 1949. Pp. xiv, 130. \$2.00.
- *Moulton, H. G., "Controlling Factors in Economic Development," Washington, D. C.: Brookings Institution, 1949. \$4.00.
- *Myint, Hla, "Theories of Welfare Economics," Cambridge, Massachusetts: Harvard University Press, 1948. \$4.00.
- Rothmann, S. C., Editor, "Constructive Uses of Atomic Energy," New York: Harper and Brothers. Pp. ix, 258. \$3.00.
- Somers, Harold M., "Public Finance and National Income," Philadelphia: Blakiston, 1949. Pp. xii, 540.
- Sykes, Friend, "Humus and the Farmer," Emmaus, Pa: Rodale Press, 1949. Pp. xxi, 392. \$4.50.
- United Nations, Department of Economic Affairs, "Economic Survey of Asia and the Far East, 1948," Lake Success, New York, 1949. Pp. xviii, 289. \$2.00.
- *Waite, Warren C., and Cassady, Ralph Jr., "The Consumer and The Economic Order," New York: McGraw-Hill Book Company, Incorporated, 1949. 2nd edition, pp. x, 440. \$4.50.

* Reviewed in this issue.

NEWS NOTES

T. A. Adams, University of Vermont, was elected President, and J. L. Tennant, Rhode Island State College, Secretary of the New England Institute of Cooperation at the annual meeting, June, 1949.

C. E. Allred, University of Tennessee, has been elected Chairman of the Marketing Section, Association of Southern Agricultural Workers.

George H. Aull, Clemson College, L. P. Gabbard, Texas A. & M. College and J. F. Timmons, Iowa State College were U. S. Delegates to the recent United Nations Scientific Conference on the Conservation and Utilization of Resources, Lake Success.

R. C. Ashby, who has completed 23 years of service at the University of Illinois, has retired. He has accepted a position in the livestock marketing field at Morningside College, Sioux City, Iowa.

Kenneth L. Bachman, Division of Farm Management and Costs, BAE, was made chairman of a Commission of specialists organized by the Army to visit the Ryukyu Islands and report on their potential production. The party left September 14 and expected to work for about two months.

Merton B. Badenhop returned to the Agricultural Economics staff at the University of Tennessee, July 1, after having spent a year in graduate study at Purdue.

Ralph L. Baker, who recently received his Ph.D. in poultry marketing, has been promoted to Associate Professor in economics at Iowa State College.

W. L. Barr has completed his Ph.D. at Cornell and returned to his position as Associate Professor of farm management at Pennsylvania State College.

Russell L. Berry has been appointed Assistant Professor, Agricultural Economics, South Dakota State College. He will do farm management research and teaching.

Warren Bilkey has been appointed Assistant Professor at the University of Connecticut.

Robert Branson, on leave from BAE is making a study of food marketing problems in Puerto Rico.

Ronald Bird joined the staff of the Department of Agricultural Economics, West Virginia, as a joint employee with the Bureau of Agricultural Economics and is engaged in egg marketing research.

Ayres Brinser, recently Economist with the Federal Reserve Bank of Boston, has been appointed Research Associate on a study of wartime rationing under the direction of Dr. Galbraith, Harvard.

Lauren H. Brown has returned to Michigan State College after a year of work with the Halderman Farm Management Service.

Daniel W. Burch has joined the Division of Agricultural Finance of BAE to work in the field of farm taxation and local government.

Glenn L. Burrows, who has been working under Hotelling at the University of North Carolina on research in multi-variant analysis, has been appointed statistical consultant for BAE to work on special problems of mathematical statistics.

Alvin G. Carpenter, Utah State Agricultural College, has been granted a leave of absence for a year for graduate study at Cornell.

Albert Conley has accepted an appointment as Associate Professor of Agricultural Economics, University of Missouri. He fills the vacancy created when Dr. E. H. Matzen accepted an appointment with the Farm Credit Administration, Washington.

Samuel L. Crockett has transferred from the Division of Land Economics, BAE, to the Loan and Purchase Division, PMA.

Samuel A. Dum joined the Agricultural Economics staff at the University of Delaware July 1, 1949 after completing his doctorate at Purdue.

Worley S. Earp and Ocie Coston have transferred from the Division of Statistical and Historical Research, BAE, to the Cotton Branch of the PMA.

Harold H. Ellis has joined the Washington staff of the Division of Land Economics, BAE. He will work on the legal aspects of land tenure.

Ernest Feder has been appointed Assistant Economist and Assistant Professor, Agricultural Economics, South Dakota State College.

V. B. Fielder, Associate Professor, University of Arkansas, taught a graduate course in Land Economics during summer school at the Agricultural Mechanical and Normal College, Pine Bluff, Arkansas.

G. W. Forster, Head of the Department of Agricultural Economics at North Carolina State College since September, 1923 will devote full time to research and teaching, effective April 1, 1950. Professor H. Brooks James, a member of the staff, has been selected as his successor. At present Professor James has been granted a six months' leave of absence to study work in agricultural economics now under way at leading institutions of the nation.

Lowell N. George, formerly at the University of Illinois, has been made head of the Department of Economics and Business Administration at Muskingum College, New Concord, Ohio.

James R. Gray has joined the Division of Farm Management and Costs, BAE, after a year of graduate work at Utah State Agricultural College, to carry on the study of family operated cattle and sheep ranches in the Northern Great Plains. Arthur Roth, who has been engaged in that study for more than a year resigned to enter private employment October 1.

Among those doing graduate work at Harvard University this year are: William Drummond, Head of the Department of Agricultural Economics at Ontario Agricultural College; Director R. B. Tootell, State Agricultural Extension Service of Montana; Miss Maurine Hearn, Director of Women's Extension Work, Texas; W. N. Williamson, District Extension Supervisor, Lubbock, Texas; W. A. Henry, University of Connecticut; Glen Barton, Maxwell Klayman and J. W. Birkhead, on leave from BAE; John Blackmore, on leave from TVA; Dorris Brown, University of Missouri; John Sharp, University of Tennessee, and M. N. Williamson, Texas A. & M.

Earl O. Heady has been promoted to full professor at Iowa State College.

William F. Henry of the University of Connecticut has been granted a leave of absence for advanced study at Harvard.

T. A. Hieronymus has been promoted to Assistant Professor in Agricultural Economics, University of Illinois.

E. B. Hill, Michigan State College, will spend the fall term working with the North Central Land Tenure Committee and the Farm Foundation. He and Marshall Harris will be preparing a regional manuscript on father-son farm partnerships and succession in farming.

Leo M. Hoover is on leave of absence from Kansas State College working at Harvard University on the Ferguson Foundation research project in farm labor.

R. R. Hudelson, Associate Dean, College of Agriculture, University of Illinois, accepted a summer assignment in an agricultural advisory capacity in the British zone in Germany.

Charles D. Hyson has accepted a post as Economist for the ECA and will be stationed at Oslo, Norway.

H. B. James, North Carolina State College, taught a course in Farm management as a visiting professor at the University of Arkansas during summer school.

Hugh A. Johnson left the BAE Division of Farm Management and Costs in June to head up economic research work in Alaska and is now stationed at Palmer.

Lloyd E. Jones has transferred from the Division of Farm Management and Costs, BAE, to the Underwriting Division, Federal Crop Insurance Corporation, Washington, D. C.

W. E. Koepper returned to his duties as Professor of Agricultural Economics, Pennsylvania State College July 1. During the last year he has worked on coffee farm management research in Costa Rica and Colombia.

Karl S. Landstrom, formerly Agricultural Economist, BAE, Portland, Oregon, is now Chief of the Division of Land Planning, Region I, Bureau of Land Management, with headquarters at Portland.

Donald Larimore, a graduate student at Harvard University during the past three years, has accepted an appointment as Economist with the ECA and will be stationed at the Paris office.

Adrian H. Lindsey was granted a leave of absence from the University of Massachusetts for the Spring semester of 1949 and spent it in study at the Giannini Foundation of Agricultural Economics, University of California.

Milton L. Manuel has been appointed Associate Professor of Cooperative Marketing, Kansas State College. He has been doing graduate work at the University of Minnesota.

H. J. Meenen has accepted a position as Assistant Professor, Department of Rural Economics, University of Arkansas.

Frank Miller of the University of Nebraska has joined the staff of the Agricultural Economics Department at the University of Missouri as Professor of Agricultural Economics to work in the field of Land Economics. Dr. Miller is taking the vacancy created when Dr. C. H. Hammar resigned to work in the Food and Agriculture section of the Army of Occupation in Germany.

Alexander J. Morin has accepted a position as Chairman of the Department of Economics and Business Administration at Fisk University, Nashville.

William Morgan, formerly of Texas A & M, recently in the Paris office of ECA, became President of Colorado A & M on Oct. 1.

M. L. Mosher, University of Illinois, was given special recognition by the U.S.D.A. for his long service and contributions to the field of farm management.

Mardy Myers has transferred from the PMA to the Division of Statistical and Historical Research of BAE. He will conduct research on dairy marketing.

Samuel Myers has been appointed to the post of Research Associate at Harvard to carry on research under the RMA contract.

W. D. Nicholls, University of Kentucky, recently spent four weeks in England making an intensive study of the English farming setup and management. These studies were made possible by arrangements with the English National Farmers Union of which 95 percent of all farm operators are members.

L. J. Norton, University of Illinois, is on sabbatical leave the first semester and will spend most of his time in Europe. He will make a study of fat and oil demand in cooperation with the Office of Foreign Agricultural Relations.

Russell O. Olson, South Dakota State College, is on leave of absence to pursue graduate study at Iowa State College.

A. L. Owens, Rhode Island State College, returned to his duties September 1, following a year's leave for study at the University of Illinois.

Walter W. Pawson has transferred from the Bureau of Reclamation, Department of the Interior, to work on the economics of conservation in the Northwest as a member of the Division of Farm Management and Costs, BAE, with headquarters at Portland, Ore.

Weber H. Peterson, Clemson College, was a visiting professor at the University of Arkansas during the second session of summer school.

C. W. Pierce while on sabbatical leave from Pennsylvania State College will serve as regional coordinator for the southern regional dairy marketing research project, State College, Mississippi. During the summer Dr. Pierce taught at Cornell after which he attended the Conference of Agricultural Economists at Rome.

Homer J. Preston, who will complete his Ph.D. at Pennsylvania State College in February, has accepted a position with the Cooperative Research and Service Division, FCA.

Mrs. Barbara Reagan, Research Associate, Harvard, has been appointed to the Bureau of Nutrition and Home Economics to assume responsibility for research in levels of living.

Sidney Reagan, at Harvard University on leave from his post as Economist for FHA for the past two years, has been appointed Economist for the PMA to make analyses of fats and oils problems.

Rex Rehnberg joined the Agricultural Economics staff at the University of Arizona September, 1949, after completing his Ph.D. at Purdue.

Thomas C. M. Robinson, who has headed the Farm Employment Section, BAE, for the past three years, has transferred to the State Department as Agricultural Attache in the American Embassy in Canberra, Australia.

George Rockwell has joined the Division of Statistical and Historical Research, BAE, to conduct research on tobacco marketing.

George B. Rogers of the Division of Statistical and Historical Research BAE, has returned from France where he was a member of the United States delegation to Third Session of Contracting Parties General Agreement on Tariffs and Trade.

Anthony Rojko has joined the Division of Statistical and Historical Research. Mr. Rojko was formerly a Marketing Research Agent with the New England Research Council.

Charles F. Sarle, U.S.D.A., is in Turkey making a study of that country's statistical needs. The project, sponsored by the Economic Cooperation Administration, was requested by the Turkish government.

Richard G. Schmitt, Jr., formerly with BAE, Division of Agricultural Finance, has joined the staff of the Rural Electrification Administration in the program analysis section.

O. J. Scoville, BAE, Kansas State College, has been designated regional technical assistant to the sub-committee on soil conservation of the North Central Farm Management Research Committee.

Stanley K. Seaver has returned to the University of Connecticut after a year's sabbatic leave spent at the University of Chicago.

Roy E. Speck, formerly with the Texsun Citrus Exchange and graduate of the University of Texas, has recently joined the staff of the Dried Fruit Division, Fruit and Vegetable Branch, Production and Marketing Administration, U.S.D.A.

Leland Spencer sailed for Europe July 12 to attend the International Dairy Congress in Stockholm, Sweden, and International Conference of Agricultural Economists at Stresa, Italy. Professor Spencer will visit several countries in western Europe where he will study economic conditions in the dairy industry and recent developments in the marketing of fluid milk.

Don Stark returned to the staff of Agricultural Economics at Michigan State College as Extension Specialist in Livestock Marketing on July 1. He has been on leave of absence for one year working with the Detroit Packing Company, a farmers' cooperative company.

Delwin M. Stevens has been appointed Associate Professor of Agricultural Economics, Colorado A & M. He has been doing graduate work on his Ph.D. at the University of Minnesota.

Hugh L. Stewart is now Assistant Head of the Division of Farm Management and Costs, Bureau of Agricultural Economics. He succeeds Neil W. Johnson who became Special Assistant to the Administrator, Agricultural Research Administration, in March 1948.

H. R. Stucky, Extension Specialist in agricultural economics for the Montana Agricultural Extension Service, has just completed a quarter's leave of absence, during which time he has been at the University of Minnesota for advanced study.

Alonzo E. Taylor, director emeritus of the Food Research Institute of Stanford University, died on May 20, 1949, at the age of 78 after a brief illness. Dr. Taylor was one of the founders of the Food Research Institute

and a director from 1921 to 1936. After his retirement he was associated with General Mills, Inc., first as director of research, then as consultant, until 1945. Dr. Taylor was a member of the American War Trade Board in 1917-1919, professor of pathology and physiological chemistry at the University of California from 1899 to 1910, and was Rush professor of physiological chemistry at the University of Pennsylvania from 1910 to 1921. He was the author of several books on food chemistry and human nutrition, papers in research and popular science, and *Corn and Hog Surplus of the Corn Belt* (1932), and *The New Deal and Foreign Trade* (1935).

The Tennessee Agricultural Experiment Station is cooperating with the Mississippi Station on a study of milk marketing in the Memphis milkshed. The Tennessee Station is also cooperating with the Federal Bureau of Agricultural Economics on a study of costs and margins of milk distributors in the Memphis area.

Tennessee and Kentucky Experiment Stations are making a joint study of both the Eastern and Western dark tobacco growers associations.

The Tennessee Agricultural Experiment Station is cooperating with the Production and Marketing Administration, U.S.D.A., in making a study of hedging practices of feed mills in the Southeast.

Tennessee University students majoring in Agricultural Economics have formed a club and will apply for a charter as a student subsidiary of the American Farm Economic Association.

Phil J. Thair has accepted an appointment with the Bureau of Agricultural Economics. He is stationed at the North Dakota Agricultural College, and is in charge of a comprehensive research project on risk, uncertainty and problems of income stabilization in the Great Plains farm economy. This project is carried on jointly by the North Dakota Agricultural Experiment Station and the Bureau of Agricultural Economics.

Gerhard Tintner has returned to Iowa State College after a year's leave of absence in Europe, during which he spent one year in research at the Department of Applied Economics, Cambridge, England. He also taught econometrics at the University of Cambridge and gave lectures at the universities of Dublin, Uppsala, Paris, Bristol, Oxford, Manchester and Hague.

Durward B. Varner joined the staff in Agricultural Economics at Michigan State College on May 10. Mr. Varner has spent the last three years as a student at the University of Chicago and is a pre-war graduate of Texas A and M. At Michigan State College he will participate in the Extension project in market price analysis and public policy in agriculture.

Warren H. Vincent, formerly instructor in Farm Management at Michigan State College, was transferred on May 1 to the position of Extension Specialist in Farm Management (Assistant Professor). Mr. Vincent obtained his Master's degree in Farm Management at Michigan State College in June 1949.

Stanley W. Voelker, Land Economics Division, BAE, has transferred from Fort Collins, Colorado, to North Dakota Agricultural College, Fargo, where he will be working on problems in land and irrigation economics in connection with the Missouri Basin Development research program.

Malcolm E. Wallace, formerly of North Carolina State College, has joined the Agricultural Finance Division of BAE to work in the field of short-term credit.

Arthur J. Walrath has returned to the Division of Land Economics, BAE, after two years with the Department of Agricultural Economics at New Mexico A & M. He will be stationed at Portland, Ore.

Thomas J. Whatley is on leave of absence from the University of Tennessee, studying for his doctorate in Agricultural Economics at Purdue.

Norman V. Whitehair has been appointed Assistant Professor at Kansas State College. He will do extension work in grain marketing.

C. P. Wilson has been granted a leave of absence from Kansas State College to do graduate work at the University of California. Harold Riley will assume Professor Wilson's work in livestock marketing.

Harry S. Wilt has recently been appointed as Assistant Professor in research in Farm Management at Michigan State College. Mr. Wilt has been on the Short Course staff at Michigan State for ten years and has assisted in teaching farm management to students enrolled in the short courses.

Karl T. Wright of Michigan State College has just returned from two months in Europe. He visited ten countries collecting information on the economic aspects of forage production and attended the International Conference of Agricultural Economists at Stresa, Italy.

H. J. Wyngarden, Head of the Economics Department, Michigan State College, since 1943, became Dean of the School of Business and Public Service, July 1, 1949, replacing Dean D. R. Rodney, who has reached retirement age. Charles C. Killingworth will replace Dr. Wyngarden as Head of the Department of Economics.

The American Institute of Cooperation has available an outline for a graduate course in agricultural cooperation which was developed at a workshop this summer preceding the Institute session at the University of Wisconsin, Madison. Also available is the report of the workshop for Extension workers.

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OUR AMAZING POPULATION UPSURGE

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THERE is real truth in de Tocqueville's old footnote: "The population of a country assuredly constitutes the first element of its wealth."¹ Though I am skeptical of all forms of fundamentalism, I hold that our most basic national resource is our people.

This week the Census Bureau released its population estimates for July 1, 1949, unadjusted for underenumeration of children in 1940. If we add to this figure, 149,215,000, the official estimate of the required adjustment, 863,000, our "true population" slightly exceeds 150 million, which some textbooks now in use still mention as our probable peak for all time. We may confidently expect the true population on July 1, 1950 to be around 152 million, roughly double that of July 1, 1900.

If the latest official postcensal *estimates* can be fairly trusted, the population of the continental United States (including armed forces overseas) increased in the decade ending July 1, 1949 by 18.3 million, or 14.0 percent.² The corresponding increase in the decade ending July 1, 1950 will surely be larger, in round figures probably at least 19 million, or 14.4 percent.³ This is more than double the absolute increase in the decade ending July 1, 1940 (now estimated at 8,893,000), and double the rate of increase in that

¹ Alexis de Tocqueville, *Democracy in America* (Aldine ed., Appleton, New York, 1899), II, 465. The Second Part, in which this footnote appears, was originally published in 1840.

² Recent monthly figures are given in Bur. Census, *Current Population Reports: Population Estimates*, Series P-25, No. 27, Aug. 19, 1949.

Such figures are based on the best data available on births and deaths, with skilled allowances for under-registration, and on carefully scanned data on in- and out-migration. Though subject to revision after the next census enumeration, as of Apr. 1, 1950, the revisions can hardly be so drastic as to affect the substance of this paper.

³ A UP release of July 31, 1949 on the Census Bureau gave this figure as the officially "expected" increase. *New York Times*, Aug. 1, 1949, p. 20.

prewar decade (7.2 percent). Contrary to confident expectations of a sharp decline in the population increase after the anticipated postwar upsurge of births, the latest reported 12-months net increase (to July 1, 1949), officially estimated at 2,644,000, is only seven percent below the all-time record figure of 2,845,000 in the 12 months ending August 1, 1947.⁴ As of July 1, 1949, the currently estimated population is 1.05 million higher than indicated for that date in the comparable Census Bureau forecast released in mid-February, 1949.⁵

Why is the population upsurge in the 1940's "amazing"?

First, the absolute increase is the largest of any decade in our history. The rate of increase is close to those of 1910-20 and 1920-30, and the rate of natural increase (i.e., excluding the influence of net in-migration) will prove to be of the same order of magnitude as in the two decades centered on 1900.

Second, 1940-50 was a war decade par excellence. In three earlier war decades—1810-20, 1860-70, 1910-20—the rate of population increase declined sharply. Warren Thompson, one of our most respected students of population problems, argued in two books published during the late war "that even under the most favorable conditions . . . war does have a very depressing effect on population growth. . . ." Philip Hauser, now acting director of the Census Bureau, argued this even more strongly and specifically in 1942.⁷

Third, the population developments of 1940-50 were totally unexpected. If, ten or twelve years ago, anyone had dared to predict for 1950 the figures that now seem sure to be reached, with or without the assumption of our involvement in a second world war, he would have been almost universally regarded as irresponsible if not insane. The events have falsified numerous and successive forecasts by those who were widely regarded as dependable

⁴ Registered births in 1948 were only 141,000 below the huge figure of 3,700,000 in 1947, and the birth rate in 1948 was apparently higher than in any year except 1947 since 1918. Through June 1949 there was little decline, and the estimated number of births in January-June 1949 was slightly higher than in the same period of 1948. Federal Security Agency, *Monthly Vital Statistics Bulletin*, Aug. 15, 1949.

⁵ Bur. Census, *Current Population Reports: Population Estimates*, Series P-25, No. 18 Feb 14, 1949, p. 12.

⁶ W. S. Thompson, *Population Problems* (8d ed., McGraw-Hill, New York and London, 1942), pp. 44-49; W. S. Thompson, *Plenty of People* (Cattell, Lancaster, Pa., 1944), p. 79. In the postwar edition of the latter book (rev. ed., Ronald, New York, 1948), chap. v, Thompson expressed a modified view.

⁷ P. M. Hauser, "The Impact of War on Population and Vital Phenomena," *Am. Jour. Sociol.*, November 1942, XLVIII, 309-322.

experts, after "a vast amount of population study and research." A continuation of the downtrends in rate of population increase, and in fertility rates, had been confidently expected. The events have upset, or at least called seriously in question, a whole series of convictions which social scientists generally had come to hold firmly. I must shortly say more on this third point.

Additional features of the population experience of the 1940's deserve passing mention. The married state has become more common, "single blessedness" much less so. The median age at marriage has declined. The number of families has risen much faster than the population.⁸ The infant-mortality rate has gone on declining, uninterrupted by the war. The maternal death rate, after long showing no clear trend, has declined markedly since the mid-1930's. Life expectancy has continued to increase, with no slackening of pace yet visible; and upper limits formerly suggested have been exceeded or are being approached well in advance of the dates forecast. The death rate in the upper age groups, which earlier was resistant to change, has been falling and bids fair to continue to fall. The increase in children under five in 1940-50 will probably be around 50 percent, and that of people over 65 well above 25 percent. The median age of the population, which rose sharply in the 1930's, has risen very little in the 1940's, and has actually fallen since 1945—if my guesstimates are not disproved by eventually detailed calculations. The crude death rate has continued to decline, despite the rise in the median age ever since 1810. Eventually, as the elderly and aged increase further in proportion to the total, this rate will rise; but no one can safely say how soon. The number of elderly and aged (say 60 and over) has risen rather more than forecast, but the proportion has recently risen much less and may be lower in 1950 than in 1940. The lengthening of life has been accompanied by extension of the period of vigor and potential productivity, altering the significance of the upper age groups.

The upsurge of population in the 1940's, moreover, has been accompanied by important net gains in the level of living. These gains, much greater than in the preceding decade, are beyond question, even though none of the common measures or indicators are trustworthy as to the extent of the improvement, and we have

⁸ Bur Census, *Current Population Reports: Population Characteristics*, Series P-20, No. 25, Aug. 19, 1949

yet no reliable over-all index. Indicative but not definitive are the decline in infant-mortality rates, the increase in per capita consumption expenditures deflated by the Consumer Price Index (35 percent between 1929 and 1948), the expansion of services provided at public expense, and a variety of others. If we could use medians instead of arithmetic averages, and make suitable adjustments for the altered age distribution of the population, the gains would show up as even more striking. The phenomenon is the more impressive because 1940-50 was a war decade.

Some Forecasts in Retrospect

Let us see how a few forecasts have stood the test to date. Bear in mind the figures I have already suggested: a true population July 1, 1950 of around 152 million; a 1940-50 increase of at least 19 million; and a 1940-50 rate of increase of about 14.4 percent.

The best forecast of the 1950 population that I have found is P. K. Whelpton's first published in 1928 (*Am. Jour. Sociol.*, Sept. 1928, XXXIV, 253-70). It will be remarkably close to the true figure, though the implied rate of increase in 1940-50 (9.7 percent) will be far below the true one. Ironically, however, Thompson and Whelpton soon abandoned this forecast. The one that they made for the President's Research Committee on Social Trends, published in 1933, and all of their subsequent ones, have been too low, both absolutely and relatively.

Pearl and Reed's 1920 forecast for 1950, with their logistic curve derived from data for 1790-1910, will also be respectably close to the true figure, though probably 3-5 million too low. It has not been disavowed, though their confidence in it was weakened when the 1940 census showed their forecast for that year to be considerably too high.⁹ Here also the implied rate of increase in 1940-50 (9.1 percent) is much too low.

The most influential series of "projections" were made in 1935-36 by Thompson and Whelpton for the highly impressive Committee on Population Problems, and published in its reports to the National Resources Committee, October 1937 and May 1938.¹⁰ The authors gave me the impression that they preferred the projection based on their assumptions of medium mortality, medium fertility,

⁹ *Science*, Nov. 22, 1940, pp. 468-488.

¹⁰ *The Problems of a Changing Population* (Washington, 1938).

and no net in-migration, which we may abbreviate as "*mm0*."¹¹ This pointed to a 1950 population of 140.6 million, a 1940-50 increase of 8,568,000, and a rate of increase of 6.49 percent. These, of course, were far too low. What I took to be their second preference, assuming low fertility instead of medium (*ml0*), indicated a 1950 population of 137.1 million, a 1940-50 increase of 5,776,000, and a rate of increase of 4.4 percent. In retrospect, this appears absurdly too low, but it won more endorsement than criticism at the time.¹² I have recently learned that Whelpton then preferred the *mm100* or *mm200* projection.

The highest projection in this 1937-38 series of six—assuming medium mortality, high fertility, and an average of 100,000 net in-migrants per year (*mh100*)—pointed to a 1950 population of 144.2 million, a 1940-50 increase of 11,751,000, and a rate of increase of 8.87 percent. A still higher projection on the assumptions of low mortality, high fertility, and 200,000 net in-migrants per year (*lh200*), published in the October, 1947 document pointed to 146.8 million in 1950—slightly nearer the truth but still much too low. *In fact, despite war losses, mortality has been below the "low" assumption, in-migrants have averaged over 100,000 per year since 1940, and fertility has been far above the "high" assumption.*

The revised projections which Thompson and Whelpton made in 1941-42 for the National Resources Planning Board, published in August 1943, were little nearer the eventual truth.¹³ They still appeared to lean toward the *mm0* projection, indicating a 1950 population of 143.9 million, a 1940-50 increase of 11,364,000, and a rate of increase of 8.57 percent.¹⁴ The slightly higher projection, which the Twentieth Century Fund chose to use in its magnum opus, *America's Needs and Resources* (1947)*—*mh0*, implying "high" fertility instead of "medium"—pointed to a 1950 population of 144.7 million, a 1940-50 increase of 12,174,000, and a rate of increase of 9.19 percent. The highest of the twelve projections given

¹¹ The precise meanings attached to these various assumptions have been changed from time to time, but for the purpose in hand the changes are of minor importance. I prefer the clumsier but more precise term "in-migration" to the commoner but looser one "immigration."

¹² This was evidently the projection on which Hansen relied in his presidential address of December 1938. Alvin H. Hansen, "Economic Progress and Declining Population Growth," *Am. Econ. Rev.*, March 1939, XXIX, 1-15.

¹³ W. S. Thompson and P. K. Whelpton, *Estimates of Future Population in the United States, 1940-2000* (Washington, 1943).

¹⁴ The Bureau of Agricultural Economics evidently relied upon this forecast in its postwar studies published in 1945.

in this 1943 document, on *mh100* assumptions, pointed to a 1950 population of 145.2 million, a 1940-50 increase of 12,674,000, and a rate of increase of 9.56 percent. All of these, moreover, were on the additional assumption of no war losses.

In 1945-46 Whelpton made another series of projections with the aid of the Census Bureau, which the Bureau published in 1947.¹⁵ Though over half of the decade had elapsed, and war losses were approximately known, the apparently preferred *mm0* projection, pointed to a 1950 population of 145.5 million (or 146.3, if adjusted for underenumeration of children in 1940), a decennial increase of 13,791,000, and a rate of increase of 10.47 percent.¹⁶ The Census Bureau adopted this projection as its own forecast, and it still stands as the official forecast for years beyond 1960. The highest of the eight projections then given, made on the assumptions of low mortality, very high fertility (averaging 3 million births a year in 1946-50), and an average of 200,000 in-migrants per year after 1945, pointed to a 1950 population of 148.0 million (148.8 if adjusted . . .), a 1940-50 increase of 16,317,000, and a rate of increase of 12.39 percent. Even this extreme projection was too low.

Finally, early in 1949, well toward the end of the decade, the Census Bureau released new forecasts, for the first time giving preference to an assumption involving appreciable net in-migration—*mm125*, implying one million in-migrants in the eight years ending July 1, 1955. This led to forecasts of the 1950 population as 149.9 or 150.7 million, according to whether the basis was unadjusted or adjusted for underenumeration of children in 1940. Both are now sure to be exceeded. The implied rate of increase in 1945-50 was 7.4 percent; actually it will approach if not exceed 9 percent.

Ten months ago the standing official forecast for 1970 was, in round figures, 160 million, and this was the figure commonly used by economists.¹⁷ Six months ago the revised official forecast indi-

¹⁵ P. K. Whelpton, *Forecasts of the Population of the United States, 1945-1975* (Bur. Census, 1947).

¹⁶ This was first published in Bur. Census, *Population—Special Reports*, Series P-46, No. 7, Sept. 14, 1946. Black and Kiefer relied on this forecast in their 1948 discussion of "The Food Needs of the United States," under the sponsorship of the National Planning Association. J. D. Black and Maxine Kiefer, *Future Food and Agriculture Policy: A Program for the Next Ten Years* (McGraw-Hill, New York and London, 1948), chap. xiii, esp. p. 119.

¹⁷ See sources cited in the preceding footnote, and P. A. Samuelson, *Economics: An Introductory Analysis* (McGraw-Hill, New York, etc., 1948), p. 30.

cated that this figure would be reached in 1960. Evidence now available strongly suggests that our true population will reach 160 million during 1955, if not earlier. Is this not startling?

While successive forecasts from 1937 to 1949 improved in approaches to the true population of 1950, all were too small by roughly one million for every year between the date of forecast and the publication of the target date. This suggests a conservative bias. Most influential and persistent has been the reiterated conviction that the fertility rate (a refined version of the birth rate) would soon fall from its supposedly abnormal peak to resume its interrupted decline. On this crucial point the evidence is still running contrary to the assumption.

In October 1945 Whelpton forecast 13.5 million births in the five years ending July 1, 1950. In March 1947, as his document was about to go to press, he raised this to 15 million.¹⁸ If he were revising again in August 1949, on the basis of births reported through June 1949, he might well put his medium estimate at 17.5 million. Here is at once an extraordinary indication of the lack of basis for a reliable forecast, and an indication of the continuation of a high rate of increase well beyond the time when it was supposed to have dropped.

Lynn Smith wrote not long ago: "To our human reservoir of 140 million people, each new year adds about two and one-half million units, draws off about one and one-half million. But the net change in any one year is far less than one percent, and anything greater would be phenomenal."¹⁹ Actually the figure of 140 million was passed in 1945, and in each of the eight years since 1941-42 the net increase of population has "phenomenally" exceeded one percent. Even the latest forecasts of the Census Bureau, already proved too conservative in 1947-48 and 1948-49, imply continuance of a rate above one percent through 1950-51, if not through 1951-52. In retrospect, Smith must have been unduly impressed by the 1930's, for our annual rate of increase has been below one percent *only* in 1918-19 and in the eleven years from 1930-31 to 1940-41.

We should not expect an indefinite continuance of the high crude birth rate, the huge number of births, and the high over-all rate of population increase that have characterized the past three years.

¹⁸ Whelpton, *Forecasts . . .* (1947), p. 33

¹⁹ T. Lynn Smith, *Population Analysis* (McGraw-Hill, New York, etc., 1948), p. 389.

Declines in these figures are likely within a decade, if merely because of the small number of American babies born in the 1930's. We need not be surprised if in some years of the 1950's the rate of population increase should fall well below one percent, even if we avoid a repetition of the major depression of the 1930's. But it is already clear that the huge number of births in the 1940's has laid the basis for another population upsurge in the 1960's and 1970's, unless fertility should fall far below the levels of the 1930's.

As to long-term forecasts, say for 1980, 2000, and beyond, I merely warn that none of them can be trusted. In the light of the productive potential the 1940's have proved that we possess, even the ultimate limits of our population are assuredly much higher than Pearl and Reed calculated and reasoned when they wrote their 1920 paper.²⁰ Moulton's recent question, whether our population might conceivably double to 300 million in the next 100 years (with an eight-fold increase in the per capita consumption level),²¹ no longer seems preposterous, though it is more than 50 percent above what Pearl and Reed computed (197.3 million) as our maximum for all time.

Some will regard the change in population prospects as the end of a bright vision of shrinkage to some "economic optimum population" at least several million below that of 1945, perhaps as low as 100 million.²² Others will view it as a welcome relief from a nightmare that has seemed all too realistic. Others will see in it a mere change in our complex of problems. It is certainly that, if nothing more.

Sobering Reflections

Let me not be understood as criticizing, blaming, or attacking the population specialists and forecasters for having been wrong in their reasoned guesses. Most of those whom I quote or cite are my friends, or at least friendly acquaintances, and I could make out a pretty good case in their behalf. If they are the scholars and gentlemen I believe them to be, they will welcome my candid

²⁰ See Lowell J. Reed, "Population Growth and Forecasts," *Annals Am. Acad. Pol. Soc. Sci.*, November 1936, CLXXXVIII, 162-166, and papers cited therein.

²¹ H. G. Moulton, *Controlling Factors in Economic Development* (Brookings Inst., Washington, 1949), chap. vii, "The Potentials of the Next Century." Moulton did not forecast 300 million population in 2049; and this figure is otherwise not properly comparable with Pearl and Reed's, since they did not assume a rapid rise in per capita consumption.

²² See an amazing passage in P. K. Whelpton, *Forecasts. . .* (1947), pp. 64-65. Cf. T. Lynn Smith's observations in his *Population Analysis*, pp. 3-4, 388-389.

exposition, and not resent it, though perhaps regretting that they had not beaten me to something better. Surely we are all devoted to the search for truth, and have to learn by our own mistakes.²³ If confessions were in order, I have many sins to confess, and I take no pride in my own forecasting record.

Though we all know that forecasting is inherently hazardous, we have tended to believe what Baker told the International Conference of Agricultural Economists in August 1930: "The population of the United States ten, twenty, even fifty years hence, can be predicted with a greater degree of assurance than any other economic or social fact, provided the immigration laws are unchanged."²⁴ Conceivably this may still be literally true; if so, it reflects most adversely upon the reliability of other forecasts. When in 1939 I publicly dissented from this view as to long-term forecasts, I clearly implied that population forecasts up to 30 years might be accepted with reasonable assurance.²⁵ In this I was gravely in error, as both the 1930's and 1940's have shown. I am ashamed that, like most of my fellow social scientists, I have so long accepted the conclusions of the population specialists with naïve faith. We ignore at our peril this general rule: we can ill afford to accept uncritically, and use as authoritative in our own work, the results of any other group of specialists. There is need of much more joint cultivation of zones in which economics overlaps other fields of specialization.

Heretofore I have been merely a "consumer" of population data and forecasts. I was "stabbed broad awake" last fall, when the Census Bureau raised its forecast for 1950 over five million above what it had predicted two and one-half years earlier. After recent careful study of a great deal of the work of the specialists, I have increased admiration for their technical achievements and assemblies of data, and profound sympathy for them as they have responded to incessant demands that they pick a projection and call it a forecast. But as of mid-1949, I have very limited respect for the judgments and opinions used in making this choice. I am also

²³ Let me quote two sentences from Stuart Chase (*The Proper Study of Mankind* . . . , Harper, New York, 1948, pp. 20, 187): "The whole point of science, says Oppenheimer, is to invite the detection of error and welcome it. . . . Real scientists take pride in their discipline and are concerned when careful forecasts go wrong."

²⁴ O. E. Baker, "Population Trends in Relation to Land Utilization," *Proc. Second Internat. Conf. of Agr. Economists* (Menasha, Wis., 1930), p. 284.

²⁵ J. S. Davis, "The Next 100 Years of the American Statistical Association," *Jour. Am. Stat. Assn.*, March 1940, XXXV, 266.

disturbed that, so far as I can ascertain, the guild of population specialists has minimized the errors of judgment, published no serious investigation into the sources of error, and been slow to warn the rest of us that several basic assumptions which have long been cherished are either unsound or seriously questionable, even if definitive proof is not at hand. There is only slight encouragement in the masterly understatement in *Population Index*, April 1949 (XV, 123): "Until recently the course of population development in Western nations was generally believed to be well charted and understood. This is now a matter of some doubt." But there are doubtless good reasons for this special case of "cultural lag."

As I see it now, it is a duty of interlopers like myself, and of consumers of population data like yourselves, to insist that old ideas be candidly reexamined in the light of evidence now available, that new ideas and evidence be sought, and that the cooperation of other specialists be enlisted in these tasks. Meanwhile, it is disheartening to have to assert that the best population forecasts deserve little credence even for five years ahead, and none at all for 20-50 years ahead. Perhaps better techniques can be found. If not, there will be a gain if we admit that our population cannot be forecast within *any* reasonable margin of error, beyond a year or two.

My samplings of economic literature through mid-1949, and of individual economists personally, indicate that the great majority of our economists, even the ablest ones, are not awake to our radically changed population position and prospects. I forbear to cite examples, including persons in our own circle. But I adjure you—teachers, researchers, and extension personnel—to scrutinize your textbooks, lecture notes, manuscripts, and talking materials to see whether you are purveying false or obsolete ideas.

You have heard the old statement: "It ain't so much what we don't know that hurts us; it's what we know that ain't so." This is better than half true. We have a big job of *unlearning* to do. Population forecasting is *not* a simple matter. Available techniques do *not* permit reliable prediction to be made for five, ten, twenty, or fifty years ahead. The best may be *far* wrong. Our net reproduction rate is *not* near unity, but has been well above it ever since 1940. It is *not* reliable as a basis for prediction.²⁶ There is *no* assurance of

²⁶ See Bur. Census, "Recent Trends in Population Replacement," *Population—Special Reports*, Series P-47, No. 2, Mar. 27, 1947, esp p 5.

any peak population, at *any* future date. The age structure of the population does *not* "inherently" point to cessation of growth and eventual population decline. Our major population problem is *not* prevention of such decline. There is *no* adequate basis for expecting the fertility rate, or the crude birth rate, to drop to or below the level of the early 1930's and to remain at that low level. While the long-term trend of our rate of population growth may still be downward, this does *not* necessarily support extrapolation of the curve from the mid-1930's. We do well to recall Raymond Pearl's observation that in this country the word "extrapolation" is usually mispronounced with the stress on the syllable "trap." Let us be on guard against that subtle disease, "trenditis," and especially its more dangerous variant, "short-term trenditis." Finally, planning for food, agriculture, industry, schools, et cetera, can *not* be safely done on the basis of supposedly expert population forecasts.

Check up on the evidence if you discount or disbelieve what I have said; but beware of relying on those who, however authoritative they appear, are loath to change their opinions until overwhelming evidence is at hand. If we continue to build on the crumbling foundations I have described, we shall have no excuse for consequent errors in our own work.

The lag of years in our understanding of important population developments is unnecessary and inexcusable for the future, if not for the past. After all the painstaking work that has been done in the past 30 years, it is surely possible to bring social scientists roughly up to date on this subject, and to keep them so. For a fair approximation to significant truths we need not wait until the 1950 census data have been collected, tabulated, laboriously analyzed, the results of analyses published, these publications studied, and the results utilized by social scientists in other books published after considerable delay. We ought to cut the period of currency of obsolete ideas to a fraction of what it is.

There are other phases of agricultural economics and rural sociology of which much the same can be said. Our basic research needs to be tied in to our current appraisals, and the usual gap between them more effectively bridged.

Hints as to Significance

You cannot expect me, here and now, to sketch all the economic and social consequences of the population upsurge in the 1940's.

The President's Research Committee on Social Trends, in its studies in 1930-33, had revealed to their eyes a population prospect "radically different from that predicted a generation or even a decade" earlier. Population experts, they said in their report, "have projected their curves into the future and the outlook is startling."²⁷ Twenty years later it will be clear that they fell into the trap of their own extrapolations! For business, private investment, consumption, and many aspects of public policy, the true position and outlook are now radically different, not only from what was pictured in 1930-41, but also from almost everything yet available in print.

One striking change is already upon us: the flood of young children entering school. Experts had led us to believe that the population of school ages had permanently passed its peak by 1940. This peak has already been substantially exceeded. The official forecasts by age groups up to 1955, and of school enrollments by grades up to 1960, point to much higher levels in the 1950's.²⁸ Though published only last February, it is already clear that these will be too low, and no one can make a reliable prediction in this important field, beyond the point at which it is affected by future births.

Four general suggestions I have to make. First, expression of national totals in per capita terms is more than ever important, even for such figures as gross national product, indexes of industrial production, and deflated consumption expenditures.²⁹ Second, several series might well be further refined (when this can be done) to adjust for changes in age distributions; for many purposes young children, and the elderly and aged, deserve less weight than persons in age groups from 15 through 59.

Third, we should be especially alert to evidence of changing *standards* of living, in the best sense of those balanced combinations of goods, leisure, other freedoms, and family life that people desire and are willing to work and save for. The notion that consumption

²⁷ *Recent Social Trends in the United States* . . (McGraw-Hill, New York and London, 1933), I, p. xx.

²⁸ Bur. Census, "Forecasts of Population and School Enrollment in the United States: 1948 to 1960," *Current Population Reports—Population Estimates*, Series P-25, No. 18, Feb. 14, 1949

²⁹ Personal consumption expenditures in 1948, as now officially estimated, were 227 percent of those in 1929. But *per capita* consumption expenditures in 1948, *deflated* by the Consumer Price Index, were 135 percent of the corresponding figure in 1929.

is the only significant component of levels and standards of living is widely prevalent. It needs to be heavily discounted. Beyond some points, I submit, people prefer less work to more goods; more freedom to more goods and shorter hours; and earlier marriage and more than one or two children to more sharply rising consumption levels per capita. This variant of a broader law, of which the so-called laws of diminishing utility and diminishing returns are other variants, merits much more attention than it has received.

Fourth, the demographic consequences of a "full-employment policy" need to be carefully explored. Expansion of so-called social-security measures, adherence to the objective of maintaining high and stable employment, and some degree of success in this direction, may constitute important new influences on attitudes that affect population development.

The special significance for agriculture I must leave to you to explore. The population developments that have already occurred profoundly affect the demand for farm products, and the altered population prospects are important for appraisals of future demand. This applies not merely to population totals but also to age distributions, and to the outlook for the short run and the long run. In this field, as in broader ones, it is useful to look back over various analyses of the consequences of a smaller and prospectively declining population, and then make reverse adjustments for a larger and rising population. Let me give one example.

On October 30, 1936, O. E. Baker addressed the Population Association of America on the "Significance of Population Trends to American Agriculture,"²⁰ to which he had adverted briefly in his 1930 address. He began: "The prospect of the early approach of a stationary and later probably declining population in the United States and in northwestern Europe profoundly alters, in my opinion, the long-time outlook for agriculture in the United States." He then expected the rate of increase in the 1940's to be "not over one-twenty-fourth." "About 1950, perhaps before," he said, "births appear likely to balance deaths; and, unless the restrictions on immigration are relaxed, the crest of the nation's population will be

²⁰ *Milbank Memorial Fund Quarterly*, April 1937, XV, 121-134. The editors began their headnote thus: "The decline of the birth rate to continuously lower levels is no longer of merely academic concern." Another sentence is worth quoting: "Whatever may be the implication of declining fertility in this country, it is generally agreed that fundamental adjustments must be made at least in our commercial structure which has been geared to the expectation of increasing population."

reached"—at some 139 million. "The weight of evidence," it seemed to him, "favors a continued decline in births for at least two decades at a rate not much less than during the past decade."³¹ He went on to discuss some consequences of a declining population: the lowered demand for milk, as the number of children declines;³² a decline in consumption of farm products, a more rapid decline in urban than in rural population; "a less commercial agriculture"; "many of the characteristics of an economic depression, including population pressure on the poorest land", and "increasing concentration of wealth," with a transfer of "poverty to rural areas." What would the converted Baker say today?

My own guesstimate is that the domestic demand for American farm products and farmers' services will be far greater than Schultz reasoned when he wrote his book for the Committee for Economic Development.³³ If so, the outlook for our agriculture is basically much less pessimistic than he then thought. The Bureau of Agricultural Economics report on *Long-Range Agricultural Policy* submitted to the House Committee on Agriculture on March 1, 1948, also needs revision. In conjunction with our higher consumption standards, I believe that our demand for milk, meat, and other animal products will become such as to put pressure upon our ability to expand the output of these products. If so, it will contribute more to the expansion of improved pastures, and to prevention of unmanageable surpluses of grains, than we have previously had a right to expect.

³¹ I am glad to say that last month, in an address at the McGill University Summer School, Baker frankly recognized the population events of the 1940's, acknowledged that he would earlier have considered them impossible, and added: "Never, it would seem, is the future so uncertain as at present."

³² He cited four urban studies indicating that children consume 50-100 percent more milk per capita than adults

³³ T. W. Schultz, *Agriculture in an Unstable Economy* (McGraw-Hill, New York and London, 1945), esp. chap. vi. As to the foreign demand, I reserve judgment.

SIGNIFICANCE OF THE "GENERAL PRICE LEVEL" AND RELATED INFLUENCES TO AMERICAN AGRICULTURE

O. V. WELLS

Bureau of Agricultural Economics

PERHAPS the best way to start is with the statement by J. W. Tapp before the Western Farm Economics Association at Davis last June:

"It is my impression that most economic historians would agree that the more violent misbehaviors of the *general price level* can be traced directly or indirectly, to disturbances which lie largely outside the realm of the so-called 'free enterprise' segment of our economy. Certainly the most disastrous of the violent upswings in the general price level in this century can be traced to repercussions from our two major world wars, and making war is not essentially a 'free enterprise job. . . .'

"It seems to me that the prime essential for a reasonably stable price level is to live in a peaceful world. . . ."

I agree not only that the greater portion of the violent fluctuation in prices, including farm prices, over the last 35 years are attributable to our war experiences but also to the clear fact that these disturbances can hardly be charged against the free enterprise system. But I assume that none of us is interested in attacking the free enterprise system. rather, our chief interest lies in first trying to see that the system does work over the longer stretches between emergencies and, second, in endeavoring even under emergency conditions to so order our economic actions as not to create unnecessary strains during the readjustment which must inevitably lie ahead.

Having said this, I next want to advance some three or four simple propositions which will exhaust the real content of this opening statement, despite the explanatory notes which follow. These are:

Proposition 1: Aside from the extreme cases such as accompany war or all out defense preparations on a grand scale, the concept of a *general price level* is not likely to prove very useful in economic analysis, especially in endeavoring to develop or appraise specific actions in the policy fields. Rather we are more likely to be interested in a series of partial, special purpose or differential price levels and the general trend in employment.

Proposition 2: The central issue in stabilization theory as to whether (a) one or a few simple, indirect fiscal devices can be used to assure a stable American economy, or (b) a series of co-ordinate devices should be developed, the most of which assist in stabilizing some essential sector of the economy instead of serving as general influences, is steadily being resolved in actual practice along the lines of the second alternative.

Proposition 3: So far as price movements are concerned, it appears that our current economic system is such that prices or rates in many fields can be raised much more readily than they can be lowered. That is, we generally define *inflation* as the concurrent upward movement of most prices and rates; *deflation* as the downward movement of production and employment and such prices and rates as are flexible.

Proposition 4: Although the farmer's first line of defense is high level non-farm production and employment, the special circumstances surrounding American agriculture are such that some of the more difficult problems relating to farm prices and the use of farm resources are not likely to be solved, by general—i.e., monetary, tariff and fiscal management—measures either to the satisfaction of farmers themselves or even in terms of the public interest.

The "special circumstances" referred to above include an apparent capacity to produce in excess of the current effective demand originating within the United States itself, an uncertain foreign market and finally a relatively immobile set of resources along with a form of economic organization which clearly indicate that reasonably prosperous conditions in farming are in considerable part dependent upon the success of farm people in maintaining or improving their collective bargaining strength.

When I started work on these notes, I assumed that this would be one session which could move smoothly forward on a noncontroversial level since economists have generally agreed that governmental control, or at least a considerable degree of regulation, had to be exercised in the fiscal-monetary field. However, some reading and a few statistical exercises have convinced me that even this hope is not likely to be realized.

I find that modern monetary theory has become an attenuated affair and that most of the current discussions now center around fiscal theory and fiscal management. That is, "Theoretical analysis has increasingly concentrated on setting forth both the determinants of the flow of spending and the effect of the resulting spending on output and employment."¹

¹ See: Introduction to Henry H. Villard's section on monetary theory in Howard S. Ellis', *A Survey of Contemporary Economics*, published for the American Economic Association by The Blakiston Company, Philadelphia, 1948; as well as the

Some 25 years¹ ago, for example, Holbrook Working started the analytical section of his discussion of factors affecting Minnesota potato prices with the simple statement: "The first factor which must be considered is the value of the dollar" and then proceeded to divide or deflate the seasonal average prices by the B.L.S. wholesale price index as the best available measure of the general price level.

Today, the terms have changed. The Postwar Agricultural Policy Report of the Land Grant Colleges declares, "High-level employment in nonagricultural industry means more to farmers than any 'farm program' the government may attempt," and Congress itself approaches the essential problem of economic stability not by a new monetary or banking route but rather through the "Employment Act of 1946."

Some attribute this shift from older quantity theory to the aggregative income approach to the late Lord Keynes who was reasonably explicit when, in referring in the *General Theory* to certain unsatisfactory economic units or terms, he said:

"The well known, but unavoidable, element of vagueness which admittedly attends the concept of the general price-level makes this term very unsatisfactory for the purposes of causal analysis, which ought to be exact."²

preface in Albert Gailord Hart, *Money, Debt and Economic Activity*, Prentice-Hall, New York, 1948.

¹ The most recent text on agricultural prices goes some distance, but by no means all the way, toward accepting this criticism:

"The general price level is a much used yet elusive term which is subject to widely differing interpretations. While it may be described simply as an average of all prices at a given time, it is difficult to comprehend, not only because of the multitude of prices entering into the average, but also because of the differing relative importance of the component price items. There is a natural tendency on the part of some persons to minimize, if not completely overlook, prices with which they have little contact and to overestimate the importance of those prices which concern them most. . . .

"Inherent in any objective concept of the general price level is the implication of a price system. If one accepts the proposition that there is a general level of prices worthy of consideration, he places emphasis on the average involved. . . . (But) even though (certain) relations between individual prices are recognized, it is hazardous to accept the general assumption that all prices are related to the extent that they move in the same direction over a given period of time. Exceptions to such a rule are easily found.

"In view of the limitations involved, the question might well be raised: Why think of a general price level at all? In the first place, there is a strong element of truth to the proposition that prices tend to move in the same direction over a given period of time, especially if the period is long. Moreover, there is a marked central tendency in a frequency distribution of price changes of individual commodities measured over a similar period."

From Warren C. Waite and Harry C. Trelogan, *Introduction to Agricultural Prices*, Burgess Publishing Company, Minneapolis, 1948, Chapter II.

Earlier still, Keynes had observed in the *Treatise* that statistical comparisons were always difficult at best and that as a general rule, for each special purpose a separate or special index number needed to be calculated.

I am myself inclined to attribute this shift in terms and methods of measurement to other sources, including the analytical hunt for *causes* as well as *effects* and the development of national or aggregative income and expenditure statistics by the statisticians in the U.S. and the U.K. In fact, one of the beloved founders of this Association, Dr. George F. Warren, had himself anticipated the Keynesian view of index numbers in developing Bulletin 999 which the U. S. Department of Agriculture released in August 1921.

Warren's calculations in Bulletin 999 were an explanation of the situation existing in the early summer of 1921, an explanation which indicated that all wholesale prices do not rise and fall proportionately and that resort to special or partial indexes were needful. To quote.

"The index of wholesale prices in June, 1921, was 151 (basis 1909-14=100)."

"The weighted average price of 31 farm products was 106 (basis 1909-14=100). These farm products, therefore, had an exchange value or purchasing power of 70 percent of the five-year average before the war." Warren further indicated that "if farm products were omitted from the wholesale price index" the average would be higher and the farm comparison still further worsened. Warren's concentration on the differential behavior of farm prices was certainly well warranted.

But Dr. Warren and many of his contemporaries were also very directly concerned with the control or stabilization of the purchasing power of the dollar or inversely, the general price level.

To a considerable extent, this concern with respect to the purchasing power of the dollar arose from the rapid increase in the farm debt structure during and immediately following World War I. I recognize the relation between debts and changing price levels but it is not a subject that I intend to further discuss, since it seems to me that the answer lies largely in the field of more prudent management of private debts and an endeavor to see that prices received by farmers generally maintain some reasonable relation to prices paid.

This concern with money or dollar purchasing power is still

current, as witness: (1) the recent statement by Dr. T. W. Schultz that, notwithstanding the peculiar properties of parity prices, "there [still] remains among the rank and file of farm people a belief that it is money, and the value thereof, that should be managed by the Government, and not the price of eggs, cattle, butter, or of any particular farm product,"³ and (2) the efforts of the American Farm Bureau and others, including some leading banking officials and the Committee for Economic Development, to secure the establishment of a National Monetary Commission to determine, in the interests of currency stabilization, "what changes are necessary or desirable in the banking or monetary system of the United States, or in the laws relating to banking or currency, by reason of domestic or international considerations or both."

The proposal for a National Monetary Commission has recently been approved by the U. S. Senate and referred to the House. Should such a Commission be established in the near future it would embark on the first comprehensive official review of the whole U.S. monetary and credit system since the study undertaken 41 years ago under the Commission created by the Act of May 30, 1908.

The approach that such a Commission might take and its final recommendations would surely be of wide interest. However, there is little reason to believe that the work of such a Commission or changes in our currency system are ever likely to yield the simple, indirect means of stabilizing the American economy which some very competent authorities once seemed to have believed were possible. This is not to say that some very useful reforms might not result; I believe they would.

But at the same time, I also believe that the really crucial issue in current economic theory—theory which influences action more

³ This is a view which Schultz does not emphasize or further develop beyond remarking that "It is a view that has much merit, for it recognizes a significant element in the pricing problem." Schultz's accompanying suggestions for a farm policy call for a wide range of positive measures dealing specifically with agriculture in line with his express statement that "what we have experienced in agriculture suggests that vigorous, enterprising farms and equally vigorous, well-designed governmental programs may be highly complementary." So far as direct action affecting average farm prices or incomes is concerned, however, Schultz joins the modern fiscal management school indicating that the first line of defense should be to stabilize the industrial economy at high production and full employment while at the same time recommending as a second line of defense compensatory farm payments in case of business depression and unemployment.

See: T. W. Schultz, *Agriculture in an Unstable Economy*, McGraw-Hill, New York, 1945, pp. 164, 219, 220, 254 and 255.

than we generally admit—turns around the question as to whether a few simple, indirect devices will carry the load or whether a whole series of additional devices must also be developed, each of which will gradually assist in giving some greater degree of stability to a particular sector of the American economy. Certainly, practice is fast trending in this second direction and this is also increasingly true of theory as such.

For example, Oscar Lange in his *Price Flexibility and Employment* indicates that it may be necessary to endeavor to directly stabilize several key items such as wage rates and the prices of certain leading farm commodities as well as using the fiscal-monetary approach. A similar inference can be made from the Journal article which won this Association's Distinguished Publications Award a year ago, Willard Cochrane's *Farm Price gyrations—An Aggregative Hypothesis*. That is, Cochrane starts from the fact that "To an important degree agriculture represents a water-tight compartment within which there is considerable fluidity, but the connective valve between the agricultural compartment and the rest of the economy works poorly and sometimes not at all." The result is that American farmers and their representatives are strongly inclined toward the "action programs" with which we are now so familiar whenever they find themselves faced with excess supplies and falling incomes, whether the cause is due to depression at home, blocked foreign demand, or excess supplies simply as the result of sheer productive ability aided by good weather. The American labor movement has also already moved a long way along this same trail with collective bargaining, a device which tends to either stabilize or gradually increase wage rates, which are our most important single series of prices. But these are only selected examples. There are any number of fields where prices or rates are semi-independent or at best are only loosely related to any central or single dominating general price influence because of immobile resources or special factors affecting the demand for or pricing of the service or product.⁴

⁴ Perhaps attention should be called to the fact that the much used wholesale price index of the B.L.S. is itself a special purpose index, despite its comprehensive commodity coverage. That is, it covers only commodities all priced at the same stage in the marketing process. It does not accurately measure changes in the purchasing power of the dollar for the average American or his family. This is much better done by a cost of living index, nor does it measure the most important single item in business costs, wage rates. That it has been so much used is due it seems to me to three facts: First, the great war-induced swings in this and other economic

It is this general line of reasoning with respect to multiple causes for economic instability and the resultant form which this gives the modern drive for economic security which leads to Propositions 1 and 2. Meanwhile the behavior of administered prices and, equally important, union wage rates of course underlie Proposition 3.

Meanwhile we are told that the current farm movement often tends to *over value* farm products. Why?

Essentially this argument defines the special characteristics of American agriculture which leads to Proposition 4.

The case runs something like this: American agriculture has an excess producing capacity which is likely to continue in use under a free price system and which will be extremely difficult to handle even assuming a strengthening of the current trend toward government regulation. Meanwhile, the demand for farm products is so inelastic, either in terms of the ordinary commodity demand schedules of the agricultural price analyst or the more recent developed income elasticities for food, that the probable supplies of farm products can only "clear" domestic and foreign markets over the next decade or more at considerably lower relative prices than the equilibrium between prices received by farmers and prices paid which has been approximated some two or three times under conditions of satisfactory employment since 1900.

Perhaps this argument is correct, especially if we assume more or less unsatisfactory employment conditions, the failure of farm programs generally, and an increasingly weak and difficult foreign market situation. But I question each of these depressing assumptions: We shall surely endeavor to so shape national policies as to work toward a brighter outcome. Various fiscal and monetary measures will be used in this effort, but I am still skeptical of attaining perpetual prosperity simply through deficit financing or, to use a newer term, financing from non-tax resources. Something more is needed.

series are of course related; second, economists and statisticians have generally been inclined to measure prices in those markets which most clearly approximate the classical definition of a "free market" and which they considered were the more sensitive indicators of economic change; and third, the wholesale price series are easiest to obtain so it is in this field that we have the longest historical series. Carl Snyder of the New York Federal Reserve Board did endeavor to develop an over-all measure of the general price level in the 1920's. So far as I am aware, it was never much used

In conclusion, it seems to me that the four factors which most immediately determine U.S. farm prices or returns are:

(1) Consumer demand within the U.S., of which the *average level of employment* is the most important single determinant,

(2) Foreign demands, of which *the availability* of dollar exchange, or the means of obtaining it, is the most immediate single determinant,

(3) Supplies of agricultural commodities and their distribution between uses or markets, actual or in reasonable prospect, and

(4) The bargaining conditions under which farm supplies are marketed.

Perhaps the first of these factors is by all odds the most important. I think it is. However, this does not mean that the supply and foreign demand factors can be ignored, nor that farm returns are not also significantly affected by the bargaining factor. Farmers can exert a direct influence in this area, and in any event it is clear that farm programs are here to stay. Such programs may well be, probably are still only in the experimental stage, but it seems to me that farmers need some specific stabilizing devices rather than simply relying upon indirect controls of so vague an average as the general price level.

Such an approach does not accept the over-valuation theory but at the same time it does not finally answer it. In general, our studies in the Bureau of Agricultural Economics have given us reason to believe that farm prices and returns may be held at far more satisfactory levels over the next five to 25 years than was the case in the 1930's.⁵ Such an answer assumes (a) that we shall gradually develop a relatively stable peace, and (b) that farmers can count on continuing activities in the farm program field.

I know that this is a prospect which alarms some, especially with the fear that the price of favorable returns to farmers will be increasing central control and regulation. I think that there is very little chance of escaping such a conclusion in case of depression and the development of an underemployed, "static" economy. However, it seems to me that the chances are we will be able to avoid this, chiefly because we are still a young, growing nation, which leads

⁵ See table 1 in the B.A.E. report, *A Study of Selected Trends and Factors Relating to the Long Range Prospects for American Agriculture*, Committee on Agriculture, House of Representatives, Eightieth Congress, Second Session, released March 10, 1948.

me to the final conclusion which may be stated as Proposition 5:

The chances of maintaining a free, "dynamic" economy—that is, of minimizing necessary controls or restrictions and maximizing the free enterprise area—are greatest in an expanding economy, probably under conditions where many of the partial price or wage levels are slowly rising over time. The growth factors in such a system not only tend to offset some of the more undesirable effects of regulation or centralization, but also minimize the need for such measures as well as offering the only acceptable solution to our most difficult farm problem, agricultural underemployment.⁶

⁶ Such a statement with respect to the essentials of economic progress is of course open to question, especially in areas or periods of extremely rapid technological improvement. The Brookings Institution, for example, is inclined toward the argument for increasing technical efficiency, declining commodity prices, and stable wage rates, all of which should lead to an increasing "real" standard of living. Alvin Hansen, I believe, argues for a stable wholesale price level and slowly rising wage rates. There is also considerable current comment about the "money illusion" which is created by rising prices. Nevertheless, it seems to me that the primary producers and small scale businessmen who are essential to a free enterprise economy will be best provided for under the proposition as stated, especially in view of the increasing trend toward rising wage rates and costs of Government.

SIGNIFICANCE OF THE GENERAL PRICE LEVEL AND RELATED INFLUENCES TO AMERICAN AGRICULTURE: FURTHER COMMENT

J. W. TAPP

Bank of America

ONE of the purposes of a meeting such as this is, as I understand it, to enable economists to engage in their favorite pastime, which is "to point out the errors of the economists of yesterday and, of course, to perform a similar service for their contemporaries." It is in this spirit that I am addressing my remarks, first toward some of the statements and "between the lines" implications in the President's address.

While I agree in general terms with Proposition 1 as stated, it seems to me that President Wells has perhaps gone too far in suggesting the limited usefulness of the concept of the general price level. The possible usefulness of the concept in extreme cases, such as war or all out defense preparations, is admitted. But, during the past 35 years, we have been devoting an inordinate portion of our lives to living through just such "war" and "defense preparation" periods. We are still in such a period with no near term prospect that we shall soon see its end. Thus, the "exceptional" war and defense impact on the general price level and the national budget is tending to become the "usual" situation, as witness our present national budget of 35 billions of dollars for past, present and future wars (including foreign rehabilitation and occupation expenditures).

I would also add a word on Proposition 1 about the need for caution in the use of "partial" or "special purpose" price levels. In some respects we have had altogether too much use of such special purpose price indexes as a basis for the development or support of a great variety of frequently altogether inconsistent single purpose policies in the farm economics field. This is true, for example, of the much maligned parity price concept as applied to individual farm products. The single purpose goal of parity prices for farm products generally is one thing. But the application of this same idea to individual farm products as a single purpose objective is sheer economic folly to any who are interested in facilitating the inevitable agricultural adjustment problems of the present post war period.

In Proposition 2 the conclusion is stated that in actual practice a series of coordinate devices are being developed for attempted stabilization of the American Economy as contrasted with the possible attempted use of one or a few simpler indirect devices. Here again I expect that Mr. Wells may be right, but the evidence is somewhat confusing. In the first place, it is not altogether clear which policies or devices are contributing toward stability and which ones are operating in the direction of greater disequilibrium rather than greater stability. Secondly, I think it might be well to give more consideration to the possibility that the use of an extensive series of supposedly coordinate devices may, in effect, make it more difficult, if not impossible, to make effective use of the few simple devices which might form the core of a limited economic stabilization program for the American economy. Between the lines I would comment on the great difficulty being experienced in keeping our myriad economic policy devices in a coordinate pattern.

The really vital question, it seems to me, is whether or not we are making the right choice, as between the use of indirect and direct devices. If we *are* moving in the direction of a series of coordinate devices, where will we be when we finally get where we seem to be going? How long a series of devices will we have? How successful will we be in keeping them "coordinate"?

Another aspect of this problem, of course, is the nature of the goals which are established for "economic stability," whether we think in terms of agriculture or the economy as a whole. The more ambitious the goals, the more rigorous and the more dangerous must be the specific devices which are to be used for their attainment. And if we insist upon quite specific goals for each important sector of the economy and the necessary special devices to quickly attain those goals, is it altogether likely that we shall avoid the type of Authoritarian State that none of us would welcome as an overall objective?

Without attempting to overstate the case, it would be well to point out some of the advantages of using to as large an extent as possible a "few simple devices" which will contribute to economic stability. One of those devices is "money management."¹ In a recent discussion of the future of the Federal Reserve System, W.

¹ See "The Future of the Federal Reserve System," W. Randolph Burgess.

Randolph Burgess stated—"There are great advantages in trying to influence economic fluctuations through the money supply. In the first place, it can be done. The second advantage of using monetary action as a method of influencing business is that this method is consistent with democracy. You don't have to tell the individual borrower or lender what to do, but you create the conditions under which he makes his own decision.

"Admittedly, the huge national debt and responsibility for the government security market have limited the freedom of credit policy since the war But, any skeptic as to the power of money in any economy does well to examine the dramatic illustrations of recent basic changes in money values and credit policies in Belgium, Germany, and Italy. These were extreme cases, but they revealed vividly the improvement that can follow large doses of good old fashioned monetary medicine."

Burgess also makes some cogent but less hopeful comments on the use of fiscal policies or "compensatory spending" as a counter cyclical device. "According to the theory, spending should be reduced when the economic goose hangs high, and increased in depressions. So far, about all we have succeeded in doing since this theory gained official sanction has been to increase the budget in both booms and depressions. Budgets are instruments of politics, and to make them also economic tools is asking much of human nature. . . . One may summarize by saying that while the budget should be an influence for economic stability, and we should do all we can to push it in that direction, we must not be too sanguine of our success."

Without belaboring the point, and with full recognition of the limitations of monetary and fiscal devices, I believe that every consideration should be given to the attainment of maximum results from the most intelligent use of the available simple and indirect devices that contribute to general economic stability. At worst any real accomplishments in this direction will minimize the propensity to experiment with more and more ambitious detailed "controls."

We should not lose sight of the fact that it has not been many months since a great many serious students of the economic scene were acutely concerned about the possibility of further price inflation. There are powerful economic forces at work which could make it possible to maintain a high general level of employment,

production and national income. Holdings of liquid assets by individuals and corporations (*including farmers*) are at a level undreamed of in any previous period on our history. The money supply is high even in relation to recent high levels of production and income. Furthermore, as contrasted with previous postwar periods, the national debt and budget situation is such that we would appear to have for the foreseeable future a depression proof money supply and relatively low interest rates. The private debt structure is not over-extended. The security and commodity markets are not threatened by over-extended speculative commitments.

Against this type of background it should be possible for those segments of the economy, faced with post war adjustment problems, to think primarily in terms of an expanding economy and alternative opportunities rather than in terms of a return to the defensive and restrictive atmosphere of the long pre-war depression years.

In spite of the above comments, I do agree in general with the statement set forth in Proposition 4 that even the most successful use of monetary and fiscal policies will not be adequate for many of the special postwar adjustment problems of agriculture. But, they can help to maintain the high level of production and non-farm employment which is the "farmer's first line of defense." Also, if we can retain reasonable flexibility in agricultural production and price policies this "first line of defense" may become a powerful offensive force for speeding up the adjustment of our agriculture to an expanding domestic market and such uncertain foreign markets as may be salvaged.

In a world which again appears to be moving in the direction of economic nationalism and bi-lateral trading, in spite of our expensive efforts to the contrary, it is of course all-important to our agriculture to maintain the broadest possible domestic outlets and expand them wherever feasible. Obviously, more can be accomplished in this direction if the general economic climate is favorable to expansion in non-farm industrial and related activities and for those branches of agriculture which are especially benefited by a high level of domestic demand.

There are good grounds for believing that the farm adjustment problems ahead may not be as serious for most lines of agriculture as those of the 1920's and 1930's, provided we face them frankly.

The "farm programs" which Wells refers to may help if they are not saddled with impossible goals and other "impedimenta." Basically, the financial position of agriculture is much stronger than that of many other segments of the economy. This is in striking contrast to agriculture in the 'twenties and 'thirties, particularly with respect to the nature and extent of farm debts and the more realistic repayment programs. A very much larger portion of agriculture is now "commercial," including the commercial family farm which purchases its horse power in the form of petroleum products instead of growing it as feed for horses and mules. True, cash expenses represent a larger relative outlay than in earlier years. These characteristics of present day agriculture should serve as a prod to the facing of adjustment problems. Adjustments, where needed, may be less postponable than in the earlier period. But if we are to meet these problems wisely and in the long run interest of agriculture and the nation, we must have some caution about trying to force farmers to fit into the all too rigid patterns which many of the current price support and related proposals would require. And I might say, quite frankly, that this is particularly true of this great Western country which looks too the future with an expansive glint in its eye. There is real concern as to whether the Congress and "The Secretary" can always move with sufficient speed, wisdom and forbearance to indulge these expectations of long term growth.

And now I conclude these rambling remarks with another quote from farmer Thad Snow of Missouri:

"The bad guesses of the dead economists of the slow-going past ought to warn living economists against over-sureness in these swift changing times."

GENERAL PRICE LEVEL AND RELATED FACTORS: FURTHER COMMENT

F. F. HILL
Cornell University

I WOULD like to comment briefly at the outset on one or two of the more obvious problems posed by the concept of a *general price level*.

It is clear, of course, that there is no such thing as a *general price level* in the sense that all prices move in the same direction at the same time and by approximately the same amount. Although a large number and wide variety of price series move in the same direction on the up and down swings associated with wars and business cycles, there are always some which do not conform to the general pattern and even those which conform as to direction show wide dispersion with respect to the extent of their movement in a given period of time. Furthermore, if one attempts to develop an index to reflect changes in the *general price level* he is immediately confronted with the necessity of making decisions on such questions as the price series to be included, the weight to be assigned each series and a host of others that give the finished product a distinctly man-made cast, frequently bearing the unmistakable imprint of its maker.

These difficulties are by no means limited to the price level concept, however. Although it provides cold comfort to the seeker of economic truth, the concepts *full employment*, *high level employment*, and *average level of employment* present much the same difficulties and might well be substituted for general price level in Mr. Wells' quotation from Lord Keynes relating to unsatisfactory economic terms. To paraphrase: "The well known, but unavoidable element of vagueness which admittedly attends the concept of *full employment* makes this term unsatisfactory for the purposes of causal analysis which ought to be exact." Certainly when one tries to reduce the concept of full employment, high-level employment, or average level of employment (the latter term used by Mr. Wells) to quantitative terms, he is confronted by a number of annoying questions such as what groups to include in the labor force, whether to weight employment in all industries equally and a dozen others that yield nothing, it seems to me, to the problems

confronting the price analyst who has the temerity to try to reduce the concept of a *general price level* to quantitative terms.

Here we are up against the practical question of whether it is worth-while to try to reduce such concepts as *general price level*, *level of employment*, and *cost of production* to quantitative terms. It seems to me it is, although I recognize the dangers of oversimplification and the fact that for many purposes it may be more productive to study the behavior of the components of the quantitative "measures" of such concepts rather than the measures themselves. One should add that in the interests of precision, the "measure" should be labeled for what it is and not be confused with the concept. For example, the index of wholesale commodity prices prepared by the Bureau of Labor Statistics should not be referred to as the *general price level*. I doubt, however, whether either agricultural economists or farmers have been led astray by such misuse of terms. Both have wandered down some economic primrose paths but they seem to me to have been of a different character.

I would like to return now to the question of whether the concept of a general price level has or can make a contribution to our understanding of the workings of the United States' economy or whether it has merely added to the confusion and is likely to continue to do so.

In Proposition 1 Mr. Wells states that aside from extreme situations such as accompany wars or all-out defense preparations, the concept of a *general price level* is not likely to prove very useful and that we are more likely to be interested in a series of special purpose or differential price levels and the general trend in employment. Reserving comment for a moment on the two stated exceptions to Mr. Wells' general proposition, which exceptions by the way seem to me to be quite important, I agree with the emphasis placed on studies of differential price behavior. Granted it is important to study the movement of individual and special purpose price series, it does not necessarily follow that a study of "general" price movements as reflected by some such index as the BLS index of wholesale commodity prices is unimportant. History is replete with instances in which the prices of an extremely large number and wide variety of goods and services have moved in the same direction at the same time. It seems to me such movements provide reasonable grounds for the assumption that under such circumstances prices may be moving in response to a common set of economic forces.

The fact that prices are moving in the same direction at the same time does not prove, of course, that the movement is the result of a common causal factor or group of factors. Much less does it indicate the nature of the causal relationships involved. It merely provides grounds for what seems to me to be a plausible hypothesis that, like any other hypothesis, must be carefully checked. If one feels there is no logical ground for the hypothesis that one or more major influences are likely to be at work during the broad up and down sweeps of prices which accompany wars and major business cycles; that there may be grounds for the hypothesis but no possibility of untangling or "measuring" such forces even if they exist; or that such theoretical and quantitative work as has been done constitutes a sufficient test and that the results are negative, then one must conclude that the general price level concept has nothing to offer.

My own view is that concurrent movement in a given direction of a large number of price series such as has repeatedly occurred in the past provides plausible grounds for the view that such movements are likely to be directly or indirectly in response to common causes. It is not necessary, it seems to me, for *all* prices to be moving in the same direction at the same time to make the hypothesis plausible nor for all prices to move by the same amount in a given period of time.

Emphasis on what seems to me to be the importance of continued study and analysis of factors outside agriculture affecting both agricultural and non-agricultural prices and more specifically the effect of monetary, fiscal and tariff policies on price movements does not mean:

- (1) That I think such studies should be carried on to the exclusion of other approaches. In a particular situation other factors, especially in the short run, may be equally or more important in determining the prices of particular commodities. In *all* situations other factors must be taken into account.
- (2) That I think monetary, fiscal and tariff policies exert the same relative influence on prices at all times.
- (3) That I think we are likely to discover or devise a simple mechanism that will enable us to keep the *general price level* "stable" as one might keep a hydraulic lift at a given level under changing loads by varying the pressure in the system. Price stability is a relative term.
- (4) That stabilization of the general price level in the sense of maintaining the BLS index of wholesale commodity prices at a given level

would solve all the problems of agriculture. We might still have too many resources in agriculture at a given time to yield returns at the margin deemed to be satisfactory from a social or political point of view.

You may feel that the foregoing statements in themselves pretty much wash up the general price level concept and the effect of monetary, fiscal and tariff measures upon prices; that like the Cheshire cat in "Alice in Wonderland," there is nothing left but the grin. I believe, however, that monetary, fiscal and tariff policies have had and will continue to have an important bearing on the price outlook in the United States' economy and that this is important to agriculture. It seems to me we have cycles in our economic thinking and that Mr. Wells has reached a new low in de-emphasis of the effect of monetary-fiscal-tariff measures on prices. I do not deny that we have perhaps over-emphasized the importance of these factors in the past. Mr. Wells has gone further than I would go in the other direction. I am not arguing for emphasizing these outside factors to the exclusive of other considerations. I am arguing for continuing to give attention to them.

But perhaps I am over-emphasizing Mr. Well's de-emphasis. His first proposition reads as follows:

"Aside from the extreme cases such as accompany war or all out defense preparations on a grand scale, the concept of a *general price level* (italics his) is not likely to prove very useful in economic analysis, especially in endeavoring to develop or appraise specific actions in the policy fields. Rather we are more likely to be interested in a series of partial, special purpose or differential price levels and the general trend in employment "

During a great deal if not most of my adult lifetime, which goes back further than I would like to admit, we have been either on an economic binge, or trying to get over one, brought on by war. If one agrees that monetary and fiscal factors have an important effect on prices during and following wars, it seems to me that from a practical point of view he is agreeing that they have been important during the greater part of the last 35 years.

I agree with Mr. Wells' second proposition that the issue in stabilization theory as to whether we shall use one or a few simple devices to try to stabilize the United States' economy or a series of co-ordinate devices intended to stabilize individual sectors is steadily being resolved in actual practice along the lines of the second alternative. I would add that I think this creates a problem

of major proportions, namely, the problem of co-ordinating the co-ordinate devices to which Mr. Wells refers. One may feel that our present approach to economic stabilization is the best approach or that it is the only one available from a practical point of view. Regardless of one's views on this question, I think there is no doubt but that the approach we are taking serves to focus attention on the economic problems of individual groups and to foster pressures to get a larger share of the national cake with no one except a few impotent economists worrying about the effect of this procedure on the size of the cake to be divided among various claimants.

I am also in agreement with Proposition 1 which seems to me to be causally related to Proposition 2. I think few would disagree with this proposition which states that our current economic system is such that prices or returns in many fields can be raised much more readily than they can be lowered. I would add that governmental action intended to stabilize essential sectors of the economy (see Mr. Wells' Proposition 2) is tending to steadily increase the list of inflexible prices and rates and that agricultural price support programs bid fare to constitute another major step in this direction. Instead of reducing rigidities in our economy, we are increasing them. Regardless of what one may think of the social desirability or political inevitability of developments in the fields of prices and wages during the past 20 years, it seems to me that the increasing inflexibility which is clearly apparent on all sides is undesirable from an economic point of view. I will go further and say that in my opinion, relatively high and inflexible prices and wages in the United States may well prove to be a major barrier to the successful revival of world trade which in turn has important implications for world peace. I agree with Mr. Wells and Mr. Tapp that a prime essential for a reasonably stable price level is to live in a peaceful world.

I agree with Mr. Wells' fourth proposition that monetary, tariff and fiscal measures, even if they could be and were manipulated in such a way as to "stabilize the general price level" would not automatically solve all of the problems of agriculture. To mention but one, technological changes are steadily reducing the number of persons required in agriculture to produce the nation's food and fiber. If returns in agricultural and non-agricultural enterprises are to be more nearly equal, there is need for a continuing transfer

of manpower out of agriculture into other occupations. For such transfers to take place, a number of conditions must be met including provision of jobs at wages sufficiently attractive to bring about the desired shift. The wage differential between agriculture and industry is ordinarily sufficient to effect the transfer of manpower. The limiting factor is usually jobs. These are affected by the price-cost outlook which in turn is affected by monetary, fiscal and tariff policies as well as other factors. To the extent that monetary, fiscal and tariff policy can be made to contribute to a greater degree of economic stability in the nonfarm sectors of our economy, orderly transfer of excess manpower out of agriculture will be facilitated. Instability in the nonfarm sectors of our economy constitutes a major handicap to agriculture, not only because of the greatly reduced demand for agricultural products on the down swings, which obviously is of major importance, but also because of the handicap which uncertainty adds to maintaining a desirable pattern of resource-use in agriculture.

In conclusion, Mr. Wells lists four factors which he thinks most immediately determine United States farm prices or returns. These are:

- (1) Consumer demand within the United States of which the *average level of employment* is the most important single determinant. (Italics his).
- (2) Foreign demands, of which *the availability* of dollar exchange, or the means of obtaining it, is the most important single determinant. (Italics his).
- (3) Supplies of agricultural commodities and their distribution between uses and markets, actual or in reasonable prospect.
- (4) The bargaining conditions under which farm supplies are marketed.

It seems to me the first so-called conclusion still leaves unanswered the all-important question of what factors affect the level of employment. Under our form of economic organization, employment is largely determined by the prospect for profits. Profit prospects, in turn, are determined by prospective price-cost relationships and prospective volume of sales. Question: Do monetary, fiscal or tariff policies affect profit prospects in any way and thus indirectly affect employment or is the level of employment determined solely by other factors? If the answer is that monetary, fiscal and tariff policies have nothing to do with prospects for profits, and therefore nothing to do with employment, the sooner we forget about them

as factors affecting the level of economic activity the better. It's hard for me to believe this is the case.

With respect to the second conclusion, I should have thought that tariff policy would have had considerable to do with the availability of dollar exchange to other countries which in turn admittedly affects foreign demand for United States' farm products. I gather the British have rather strong views on this question at the present time.

Supplies of agricultural products certainly will have an important bearing on farm prices and returns (conclusion three). Bargaining conditions under which farm products are marketed will also have a bearing on farm prices and returns (conclusion four) although it is easy to over-estimate the possibility of increasing farm prices and returns by strengthening the bargaining position of producers. There are plenty of examples of this in the agricultural history of the United States.

Mr. Wells' final conclusion, also stated as Proposition 5, is that:

"The chances of maintaining a free, 'dynamic' economy—that is, of minimizing necessary controls or restrictions and maximizing the free enterprise area—are greatest in an expanding economy, probably under conditions where many of the partial price or wage levels are slowly rising over time."

I agree with this general view and also with what I take to be Mr. Wells' position that there is no reason to believe our "dynamic" days are over. In other words, there is hope.

CURRENT TRENDS IN AGRICULTURAL POLICY

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THIS discussion of current trends in agricultural policy will be confined to agricultural price policy. There are other agricultural policies more important in many respects than a price policy. A farm price support program will not solve the problems of the farmer. Agriculture is inter-dependent with the rest of the economy. A high level of business activity and production, world peace, international trade and a more stable general price level are some of the other problems much more important to agriculture. We must remember that in 1939, in spite of a maze of government programs, farm prices were lower than they had been in nearly 30 years, except for the worst years of the great depression.

We are going to have farm price programs. Although we have recently experienced the most prosperous period in American agriculture, we still find almost united support among farmers and law-makers for some kind of an agricultural price program. The differences of opinion today are not in whether there should be a program, but at what levels supports should apply. The basic question is, "Are we going to have a support program to protect agriculture against low prices—with comparatively free markets above these levels—or are we going to have governmentally administered farm prices?" As of today, August 8, 1949, it looks like there is about a 50-50 chance either way. For one who believes that the free market price has a useful function to perform in our society, that 50-50 chance is too close for comfort.

The current trend is toward higher peace-time supports in agriculture, which likely means more government regulation in agriculture. The trend toward more government is not confined only to agriculture, but encompasses other segments of our economy. Regulation, in itself, is not necessarily bad; but regulation which simply defers a problem or fails to accomplish constructive ends is another question.

The politician goes further than the farmer in demanding things of government which will lead to more and more controls in agriculture. Time after time the politician has exceeded the requests of farmers from government. A classic example is the current proposal

of the Secretary of Agriculture for high support prices, which was not requested by any of the major farm organizations.

It is not the purpose of this paper to point out the shortcomings of existing farm price programs. The major weaknesses, as I see them, are that they treat symptoms rather than causes; they will require entirely too many governmental controls; and that insufficient attention is given to programs to increase the demand for farm products. Serious consideration of the demand type of approach will likely have to wait until storage stocks become even larger, or a considerable slackening in demand occurs. This does not mean that economists should cease working on the problem. It is recognized that a price program will not materially aid that large segment of the people now classified as farmers but who produce very little.

All farm price programs have trends in common; whether the Agriculture Act of 1948, the Brannan Plan, a compromise, or any other likely farm price program. If farmers accept these programs, they should be prepared to accept many of the following trends along with them. The higher the price support, the quicker they will have to accept these things. Many of these trends are not to my liking, but they are presented as I see them.

(1) The trend is toward more—not less—government control in agriculture. There may be some exceptions as compared with the peak wartime control, but not when considered in terms of controls as they existed prior to the war. Falling prices will encourage more government controls. These controls may not be confined to production controls, but may extend to other phases of farming. A review of the provisions of sugar legislation may be some indication of what is ahead for other programs. The sugar legislation provides for varying payments according to the size of the producer; a smaller producer receiving a higher rate per hundredweight than the larger producer. Persons employed on the farm have to be paid wages deemed to be fair and reasonable by the Secretary of Agriculture. Deductions from the payments are made if child labor is used. Of course, farmers have to stay within their acreage allotments. It is very doubtful if farmers can accept such programs without also accepting controls.

(2) The program will accumulate large quantities of storage stocks. Personally, I have never worried about the necessity of accumulating reserves as long as we have price fixing programs.

The unsolved problem is not how to accumulate stocks, but how to get rid of them when they are priced above, or even at the prevailing market price, without running into political difficulties. This problem needs a tremendous amount of work.

Farm programs will always be in trouble from the standpoint of the economist. The reason farmers want these programs is that they do not want to accept a free market price. Consequently, when attempts are made to have other than a free market price, we will accumulate stocks and be faced with many of the other problems that arise when market prices are interfered with.

(3) In any agricultural price program that we are likely to have, there will be production controls. Practically every postwar program written for agriculture berated production controls. Where they were given any place at all, it was stated that they are to be used as a last line of defense. Such statements were made not only by the economists, but by high government officials and farm leaders. Yet, as was always evident to some who observed the developments closely, we have seen the last line of defense become the first line of defense.

Production controls are part and parcel of a farm price program. The business man cannot understand why the farmer keeps on producing if he has more than the market demands at a satisfactory price. His reaction is, "If you have too much, do as I do, cut down your production." This type of thinking is deep-seated in the business world. Nearly 80 percent of the Congress of the United States—which has the final say on these programs—is made up of lawyers and business men. The experience of the lawyers has been in serving business clients. When farmers go to Congress for relief, the logical reaction of the Congress is, "If you have too much, reduce production." I do not mean this as an endorsement of production controls or an implication that they are the best solution possible. It is simply a statement of reality.

These production controls will become compulsory with the passing of time. When voluntary controls fail to accomplish their attempted purpose, the next step is compulsory controls. This is already evident in some of the crops grown in the South. The tendency is not to abandon controls when they fail to work, but to add more and more controls. This poses some very interesting questions, such as: What do you do with the acreages taken out of production? Will these controls lead to an overall marketing quota for the entire

farm, rather than quotas for individual products, which permits the farmer to switch to other commodities?

The statement is often made that these programs are democratic because it takes a two-thirds approval by farmers before quotas become effective. This is a slightly different concept of democracy. While democracy is based upon majority rule, it is also based upon protection of the minority. These programs also place farmers in a situation where they will be penalized heavily unless they vote "right."

(4) There will be payments from the Federal treasury direct to farmers. These are called by various names; such as, parity payments, compensatory payments, production payments, or direct payments. It is doubtful if there is any other way to operate a program for some of our perishable commodities. Economists are not being realistic when they think direct payments would eliminate production controls. They may eliminate production controls if support levels are low enough. But with the kind of support levels currently being discussed, direct payments likely will be accompanied by production controls. If this is questioned, all you need to do is try to figure out a program to maintain a high support price on some of our major perishable commodities. Remember there may be a limitation of funds that Congress would be willing to appropriate in order to make up the difference between the market price and the support price. You will find that production controls will be necessary to reduce the cost of the program. You will also find that direct payments tend to make it easier to exercise controls over the non-cooperators than if attempts are made to stabilize prices by government purchases. With direct payments, checks can be withheld from the farmer who goes over his quotas or produces a wrong weight or type of product; while if market prices are maintained, it is more difficult to put the squeeze on the fellow who doesn't go along with the program.

(5) There will be more centralization in the administration of these price programs. Farmers and farm organizations have done a lot of talking about decentralized controls, yet the trend has been in the opposite direction. It is questionable if a control program can be de-centralized! Each area and community wants to get as high an allotment as possible. These allotments have to be determined on a national basis. Farm prices are determined nationally and internationally, not in a local region.

There is also a trend to give the Secretary of Agriculture more discretionary power. This trend has taken place even though many farmers and congressmen have insisted that formulas be set up to be used in administering these price programs. The administrator himself would be very happy to have formulas so he could go ahead and act, then pass the responsibility to Congress for the consequences of the program. Yet as these programs become more complex, it is increasingly difficult to write formulas which will apply to changing conditions; consequently, more discretion is being left to the administering offices.

(6) There is a trend in Government pricing programs to pay more attention to the unimportant crops, or at least those crops which account for a smaller percentage of the total income. Emphasis is often placed on the minor crops, such as peanuts, tobacco, raisins, tung oil, walnuts and honey. It is easier to administer a program on a relatively unimportant crop than it is to tackle some of the more complicated problems. Administrators like problems they can handle.

(7) There will be a trend towards greater use of marketing agreements. At present there are in the neighborhood of thirty milk orders or agreements in fluid milk markets. This number will likely increase if prices decline. It is interesting to observe how some folks bitterly criticize government farm programs in other fields, yet endorse milk orders, which contain as much, or more, price fixing than other farm price programs. The use of marketing agreements for fruits and vegetables, which now contain less price fixing than milk agreements, will likely increase, with more pricing provisions included.

For several years legislation has been introduced in Congress which would permit the operation of marketing agreements on any agricultural product. Legislation, if introduced into Congress year after year, quite often finds its way into law.

(8) The trend will likely be towards use of more export subsidies. This raises some very serious problems in the coordination of our domestic agricultural programs with our foreign policy. We all like to deal in terms of things as they should be, or as we would like to see them—which quite often is not the way they actually are. Perhaps we might give more thought to how to work these subsidies into foreign policy so that they will be of the least possible harm.

(9) The trend has been to start these programs at a comparative-

ly low support level and then increase them with the passing of time. There are indications that this trend may be reversed by starting the programs at a high level, accumulating a lot of controls, then lowering the support price but retaining the controls.

(10) These farm programs are becoming more and more political with the passing of time. The current developments are a prime example. At one time attempts were made to administer these programs on a bi-partisan basis. This is rapidly becoming extinct, even at the local level. This type of politics is confined not only to pricing programs, but extends to some of our other agricultural programs.

(11) The trend is toward a limitation of the size of the producer that may participate fully in the program. Secretary Brannan's plan contained such a limitation. It is not the first time that limitations have been suggested or enacted into law. This type of limitation may not be enacted this year, or for several years, but it is part and parcel of the deal. If the farmers want these programs, sooner or later they can expect differential treatment between the larger and smaller producers. In all likelihood, after such limitations are established, there will be a tendency to reduce the criteria of what constitutes a large farmer. This possibility may pose some interesting questions from the standpoint of efficient farm management.

The trends in current agricultural policy which I have discussed are trends as I see them—not as I would like them to be. As educators in the field of agricultural economics, we have a grave responsibility—responsibility to point out to farmers what is involved in various approaches. We should never cease in our efforts to influence these trends into more constructive channels.

COMMENTS ON AGRICULTURAL POLICY

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I QUOTE from the last few paragraphs of Dr. Galbraith's paper, "With the pattern of agricultural policy now being followed there is plenty of room for wisdom and for error. . . . The problems connected with current policy are not ones of kind but of amount. . . . The record amply indicates we can survive the several lines of policy with which farmers have sought to counter differential market power and quite possibly with benefit to the community as a whole."¹ This last statement is particularly reassuring following the detailed historical analysis presented. Two economists never agreed more fully than Dr. Galbraith and I on these points.

I should like to make a few interpretative comments on the current scene. I want to list the six major proposals for change in the administration's controversial proposals for modifying the 1948 Act. They are:

- (1) Drop the outdated 1910-1914 base period and shift to a recent farm income purchasing power goal for determining individual price supports.
- (2) Extend the mandatory price support list to include livestock and livestock products.
- (3) Implement price supports for perishable products with production (compensatory) payments.
- (4) Restrict the price support benefits in so far as possible to keep them from encouraging further concentration of farming operations in larger than family size units.
- (5) Include minimum conservation practices as one of the requirements for eligibility for price support benefits.
- (6) Support prices at roughly 18 to 30 percent above the minimum levels specified in Title II of the 1948 Agricultural Act.

Of Secretary Brannan's six major proposals for change, in the light of my analysis and I believe in the light of recommendations of committees of this Association, the first five are distinct improvements over existing legislation.

In common with almost all agricultural economists with whom I am acquainted, I have doubts about the desirability and feasibility of Secretary Brannan's proposal to support prices at 18 to 30 percent above the minimum levels specified in Title II of the

¹ A paper read before the American Farm Economic Meetings but withheld from publication to permit additional work on it.

1948 Agricultural Act. But I do not view this proposal with alarm. One doesn't need much political experience to conclude that there is little danger that price supports at too high a level will be adopted if direct government payments are used to implement any large part of them. The real danger is that Congress will not provide effective supports at any reasonable level for those products where direct payments are the only effective means of implementation. Congress simply will not appropriate the necessary funds.

But a more serious issue emerges from another sector, one in which there has been little controversy since 1938. I refer to the great reliance placed on production controls carried over from the 1938 Agricultural Act and extended but not improved in the 1948 Act. Now Secretary Brannan proposes to extend these same controls to additional products added to the price support list. The continuation and extension of production controls on the 1938 basis might be overlooked if one could be sure that all other alternatives had been thoroughly explored and found less satisfactory. Experience indicates that used in moderation as in the 1930's our American variety of production controls may have results precisely the opposite of those expected, increasing the output of agricultural products while conserving more of our soil resources.

In judging future performance we should look at the pedigree of these American production controls. They were conceived during the frustrating experiences of the Republican Farm Board days, born under emergency conditions following the Democratic Bank Holidays, and grew to maturity in the miraculously short period of five years between 1933 and 1938 in the most unhealthy environment of continued unemployment in the history of this country. Yet no one raised any objection when both the Republican leaders in 1948 and the Democratic leaders in 1949 proposed marrying price supports designed for periods of normal economic activity to an implementing program of such unhealthy family relations.

When I tell government administrators that these controls never have worked successfully (except perhaps for tobacco) they are inclined to agree with me. But then they begin talking about conservation acres—idle acres—similar to the provisions of the 1934 AAA contracts. Leaving aside the debatable question of whether or not we are likely to get farmer and public acceptance of effective and really restrictive over-all production control programs, I want to question their economic value to farmers. Many members of

this distinguished group have noted that effective farm production controls would have anti-welfare effects. I question even their economic value to the producers they are designed to help.

Short-run monopoly gains can be obtained from production controls when producers control a large proportion of the total supply coming on the market and when the demand for the product is inelastic. This latter requirement in effect means that the possibilities of product substitution are limited. How many agricultural products fall within the above classification? Tobacco, perhaps. Cotton, wheat and rice producers must sell a substantial share of their product in the world market. They do not control a large proportion of the world supplies. They cannot obtain economic gains from restricting production except as necessary to meet the requirements of government programs.

Cotton farmers have in effect said to me, "We are not asking for a government subsidy. Just allow us to set a fair price on cotton (92 percent of parity) and adopt production controls as necessary to maintain that price." Without a government subsidy on exports or some multiple price plan in addition, I am confident their total income from cotton would be smaller as a result of their production restrictions. The same is true for wheat and rice although the problem of product substitution is much greater for cotton than for these two products. In all three cases it is unrealistic and uneconomic for the producers of these products to restrict production in the near future to the amount which would sell in the domestic market at the desired price. Domestic producers of these products do not have the machinery for raising world price levels.

The situation for corn at first appears to be different. The entire crop is domestically consumed and analyses indicate the demand curve to be inelastic. Surely farmers can obtain short-run gains by restricting production under such circumstances, but here again we run into product substitution and even more important, demand for meat animals, the end product of most corn, is only slightly inelastic. On the technical side a little improvement in feed crop production or feeding techniques, would offset any moderate production restrictions.

The point I want to make is that if farmers were given the machinery to operate production controls—and no other machinery for stabilizing and increasing their incomes—while they might stabilize their income somewhat they would almost certainly lower

it, even in the relatively short-run. The evidence is overwhelmingly against the possibility that effective production controls would obtain long-run economic gains for farmers. Why then do we use production controls as our major method of implementing price supports? Before outlining what I believe to be a more promising method of implementing price supports let me make a few background statements.

- (1) Within the foreseeable future farmers will be producing and selling in an environment of high industrial activity. Specifically, high levels of wages, employment, and economic activity by any prewar standards are far more probable than a return to the levels of unemployment and business activity of the decade before World War II.
- (2) Farm price supports are now an accepted part of the American economic scene, and in one form or another may be expected to continue to play an important part in our economy throughout the lifetime of the youngest member of this audience.
- (3) They will be extended to additional farm products as rapidly as is politically and economically feasible.
- (4) They will be maintained at as high a level as permitted by the force of economic events. (Most of the political pressure at the present time is in the direction of higher price supports, with the notable exception of the Farm Bureau and the farm economists.)
- (5) We will continue to separate domestic from world prices for export crops much of the time, at least until some new world trade considerations present their appearance.

These five propositions constitute my frame of reference when considering policies or programs for implementing price supports. Another aspect of my frame of reference is a bias toward agricultural policies which require as little direct government interference as possible with citizen actions—actions of either producers or consumers. Given these propositions and my bias toward minimum government controls I find myself exploring a program of implementing price supports similar to what I believe some people vaguely call the Babcock or livestock program.

Farmers and farm leaders who lived through the depression of the 1930's fear that we cannot maintain over-all favorable farm prices and incomes and utilize our agricultural plant to its full capacity. This of course is the crucial question. Although the big feed crops of 1948 and 1949 have raised some doubts in my own mind I still believe that we can market all we can produce at prices which will permit us to maintain a standard of living for families

on efficient farming units comparable to the standard of living of non-farm families if: (1) our present domestic buying power is maintained and continues to grow as it should in an expanding economy; (2) if we maintain postwar foreign markets at reasonable levels, and (3) if we will devise and maintain appropriate economic incentives (prices and supplementary devices) and shift our surplus resources in our major export crop areas (mainly wheat and cotton) into the production of meat animals and dairy products.

I am not yet ready to subscribe to the theory of total over-production for agriculture.

Let me restate my basic position in simpler terms. I do not believe that the loss of foreign markets and the rapid rate of technological progress is going to give us total over-production in agriculture in an economic sense. I admit the situation looks threatening—and I may be wrong. But we should remember several things—first, we have no assurance that these bumper crops in the Western Cornbelt and the Plains states will continue—second, the domestic market for our farm products in terms of purchasing power in the hands of non-farm people has tripled since the prewar years while farm production had increased around 40 percent—and finally, the shrinkage to a more normal size of the abnormally large foreign markets of recent years, if all the resources released were diverted to livestock production, would only increase livestock output by 5 to 6 percent.²

In the political debate following the announcement of the new proposals many people seem to have overlooked a key element in them. This was the proposal to support livestock prices at favorable levels relative to other farm prices. This is a really new approach in the price support field, one which holds promise of encouraging more rapid progress toward our national nutritional goals, our soil conservation goals and continued full employment at satisfactory prices for our American agricultural resources. But in the heat of the controversy over the non-economic issues, it looks very much as though the baby has been thrown out with the bath water. The compromise bill which Senator Anderson introduced, and which already has gone through many revisions now proposes to:

² An annual surplus of wheat of 375 million bushels if converted into livestock products would increase livestock production 4 percent—See "What Will We Do with Our Wheat Surplus?" by W. W. Wilcox, July 1949, Farm Policy Forum Resources shifted out of cotton and other export crops would be less than half as important as the wheat.

- (1) Raise the minimum support level range for basic commodities to 75 to 90 percent of parity with 90% supports required the first year; acreage allotments are in effect regardless of the supply of the product.
- (2) Include hired labor costs in the prices paid index, thereby raising all parity prices 5 to 6 percent at the present time.
- (3) Include dairy products, potatoes, and perhaps one or two other commodities in the mandatory support list. Specific authorization for the use of production payments on livestock was included in the first draft of the bill but has been omitted in later drafts.

Political forecasters predict that this compromise measure will pass the Senate and form the basis of a compromise with the House of Representatives. When one applies economic criteria he finds that this compromise provides as high or higher price supports on the basic crops (the crops in which market surpluses already exist) as do Secretary Brannan's proposals. This new compromise measure not only fails to include livestock products in the mandatory support list which may not be important, but as a result of the legislative history of this bill, specifically dropping the production payments feature, it is more restrictive on livestock price supports than the 1948 Act. (The 1948 Agricultural Act authorized the use of direct payments as one of the means of implementing supports and permitted price support operations on the non-basic commodities at the same levels as required and permitted on the basic commodities—up to 90 percent of parity.) Thus it seems probable that we will enter 1950 with legislation more likely to intensify and prolong existing maladjustments within our agricultural economy than either the existing legislation or Secretary Brannan's proposals.

If it were politically feasible, from a resource use and national welfare standpoint, the commodity groupings should be reversed. Livestock products should be supported at moderately high levels with a lower support level on the basic crops, but this might not give sufficient income protection to the producers of crops in excess supply. Unquestionably any system of price supports must take into account the price and income situation for individual producer groups. We are apparently committed to maintaining fairly satisfactory incomes for cotton producers, e.g., while using other means of encouraging them to shift into other lines of production. In terms of politically acceptable alternatives, relatively high price supports and acreage allotments for key surplus non-feed crops

may be the best program available. If acreage allotments for each of these surplus crops were set in terms of integrated diversion goals, rather than as at present by independent market supply formulas we would have the beginning of a farm program adapted for the economic times ahead of us rather than our present depression-dated model.

We have lost valuable ground in our current controversy. I would like to see administration and farm organization leaders get together and work out a program of price supports and implementing programs on as wide a basis and at an over-all level as high as *but no higher* than is consistent with full farm production, assuming that we will have the domestic and world purchasing power to take that volume of production at satisfactory prices except for brief cyclical periods.

But as a precautionary measure I would like to have them set up plans for dealing with the situation in case the weather and rapid technological progress do give us more total volume of agricultural products than can be sold at prices which will give farmers satisfactory incomes in relation to the cost of things they buy. Production controls should be considered on their merits, but even under these conditions I am confident that other implementing programs hold much greater promise both for farmers and for the general public. I refer particularly to the extension of multiple and class price plans for our major export and feed grain crops and class prices for some of our key foods. I hope measures of this type can be worked out in such a way as to avoid the need for direct government appropriations to finance them. Farmers will have little confidence in a program that requires large government appropriations each year. And with good reason. Because of this political consideration I place near the bottom of my list of implementing programs the Production Payment Plan we have heard so much about the last few months. But I place even lower the production controls as spelled out in the 1938 Act and as continued in existing legislation.

Parenthetically let me mention that I see no economic basis for the widespread belief that artificially maintained total farm income at above free market levels leads to inefficient national resource use. I am aware that orthodox equilibrium analysis reaches this conclusion, but equilibrium analysis does not take into consideration the dynamics of technological progress and labor mobility.

This point is discussed further in a note in the August issue of the JOURNAL. At this time I merely want to emphasize that the important consideration is relative prices and other economic incentives within agriculture. If these are kept in the right relation to each other and excess resources are channelled into the production of products having the most elastic demand schedules, I have no fear of adverse resource use effects resulting from modest transfers of income from non-farmers to farmers. National resource use in the United States is likely to be more efficient under such a program using either T. W. Schultz' or Bushrod Allin's definition of efficiency.

Returning again to the main theme, I would like to have administration and farm organization leaders work out a program for a third possible situation. They should have a price support and implementing program ready in the event serious unemployment develops. Their first program should be designed to care adequately for the usual business cycle and weather fluctuations, but a program adequate for such circumstances may not be adapted for dealing with a major depression. A separate program or a series of supplements may be needed.

Actually the working out of a program for this third situation should be relatively simple for we have mistakenly devoted almost all our postwar planning efforts to this problem.

But the crying need at the present time is for a system of price supports adapted for functioning in periods of a high level of economic activity. The critical consideration here is facilitating some long-time shifts in resource use, particularly away from current acreages of cotton and wheat toward larger acreages of grasses and feed crops and meat animal and dairy production.

FOREIGN TRADE POLICY—WHICH WAY?*

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THE favorite bit of advice offered today on our international affairs is that "we must be realistic and start from where we are." This is inescapable. We cannot move from where we are not. If we like it where we are and if we like what we have, moving elsewhere may have no appeal. If we do not, we ought to be concerned not merely with moving but with finding a road which gives real promise of leading to improvement. Even those who may be satisfied with the status quo will do well to do some appraising. They may find that the present is not as attractive as they may have assumed. They may, in fact, discover that staying where they are may involve some troublesome problems or perhaps be impossible.

Where are we? World trade, like the Traveller among the Lilliputians, finds itself bound hand and foot by tariffs, quotas, exchange controls, state trading, and dollar shortages. Fear of war, political and economic instability and conflict between ideologies cloud the skies. The present situation is to a major extent the inheritance of two world wars and a serious world-wide depression all within the span of a single generation. These occurrences have disrupted production, markets and trade relations.

What have we done and what are we doing to meet this situation? The United States assumed a modest degree of leadership in the direction of freeing trade in the adoption of the reciprocal trade program in 1934 and its continuation since then. While it is impossible to appraise all the results of this program with nicety, there is reason for assuming that it has played a significant part in slowing down and, to some extent, in reversing the world trend towards economic nationalism. The lend-lease program adopted before our entry into the war was a more realistic facing of facts than the war loans of the previous war. While UNRRA fell short of the expectations of many, it did help to continue a flow of goods for a time after the lend-lease program ended. The efforts at international cooperation represented by the United Nations have relied heavily on our leadership. The Marshall plan is a very frank facing of the

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fact that we do have a concern with recovery of production elsewhere and the development and maintenance of world trade.

These programs surely point to our interest in international cooperation. Whether that concern is sufficiently strong to withstand pressures of short-run domestic interests which may run counter to it is something still to be demonstrated.

What are the bases of our international interests? The growing realization that the United States is not a self-sufficient nation surely is one of them. Our production in certain lines is expanded beyond the capacity of the domestic market so we have real need for export markets for both agricultural and industrial products. On the other side, we remain dependent on imports of other goods. A feature of our international trade is that to a considerable extent imports consist of raw materials from the South Pacific and Latin America, while exports tend to go more largely to Europe. Bilateral trading does not fit our situation. Multilateral trade is necessary if our exports are to pay for our imports.

There is a healthy skepticism among Americans over state trading. We have seen how states may ignore costs and use trade to help attain political or military ends. Many Americans believe strongly in leaving as much economic activity as possible in private hands. Foreign and domestic trade are not separate fields but different facets of the same thing. Control in one sector leads to control in the other. In view of this, it is unrealistic to expect freedom of operation for private endeavor on the domestic scene if actual carrying on of international trade is assigned to the state. This does not mean that governments have no function to play in international trading. Rules for playing the game are essential. It is one thing, however, to regulate trade through tariffs, exchange rates, monetary measures and the like; it is something else to carry on actual trading itself.

Among those who have any real understanding of the conditions confronting the world after the war, there is extensive agreement that the European Recovery Program has a vital function to perform. Both the production and buying power of war-torn countries were seriously disrupted. There was immediate need for improvement in the food situation and a longer-run need for the reestablishment of production and an improvement in productive capacity. In spite of short supplies of such vital materials as steel in the United States, our supplies of both food and raw materials repre-

sented abundance in comparison with Western Europe. The need was urgent; the available means with which to purchase in our markets were extremely limited.

The Marshall plan represented a realistic recognition of this problem. It saw that the solution called for some direct aid from the United States but that such aid would become primarily relief unless the European nations themselves assumed major responsibility for working out solutions to their difficulties. While the program necessarily has had to include some direct relief its major feature is a recognition of interdependence among nations in the modern world. The program rests on a hard core of reality of self-interest as far as the United States is concerned. We are beneficiaries as well as benefactors. Our well-being is inseparably linked with that of the rest of the world. Prospects for enduring peace are vitally affected by recovery of production and trade the world over.

Our questions with regard to the ERP are not so much over its objectives as over whether it is going to do enough. Production will not be fully restored and problems of dollar shortages will not all be solved by the time the present program runs out. Realistic exchange relationships need to be established. The nations involved will have to be ready to buy as well as to sell if the program is going to achieve success. Production efficiencies need improvement. Plants need rebuilding and modernization. Too much political instability still remains in some of the countries. Nor is it clear that everyone in those countries is ready to face up to the hard, cold facts which confront them. Governments are not too anxious to dwell on such facts because they are not certain of the effect on elections. The division of Europe into East and West and the sparring for power and influence which is under way create additional difficulties. How to fit Germany, particularly handled as two rather than as one economic unit, is not the least of the posers. The pace of recovery in Western Germany creates fear of competition which adds complications.

The International Monetary Fund, the International Bank for Reconstruction and Development and other forms of cooperation under the United Nations promise to be of material aid in trade and other economic relations under more normal conditions. They are not well suited to playing a major role in getting out of present dilemmas. The International Trade Organization, while not fully

established as yet, represents at least a step in the direction of providing machinery for working out better trade relations in the future. The ITO, however, is under fire from some who think that it goes entirely too far and from others who see too many weak spots and loopholes in its present organization and charter.

Naturally, enthusiasm for ITO is not to be expected on the part of those who look with disfavor on efforts to expand trade. How much merit there is to the objections of others who feel that its charter has been unduly and unnecessarily weakened by too many concessions is a matter of opinion. Much depends on how the participating nations will employ the ITO. If they use it in sincere efforts to improve trade relations and seek every means to increase its effectiveness, valuable results should flow from it. On the other hand, if they fall back on its escape clauses and protective devices to avoid making needed adjustments, the ITO might interfere with rather than aid trade expansion and recovery. This is another spot where heavy responsibility rests on the United States to provide effective leadership.

This recital while incomplete shows that the nations of the world face Herculean tasks in adjusting their economies to more effective international trade and cooperation in the years ahead. One very grave danger is that the problems of the moment may loom so large that the temptation to yield to expediency may become well-nigh irresistible. Unfortunately, such yielding will hinder rather than aid the longer-run adjustments. If persisted in, short-run expediency becomes long-run policy.

Because of her importance in world trade and the magnitude of her present-day economic problems, Great Britain exemplifies in marked degree problems which nations face today in living with the world. Great Britain could not have attained a position of prominence in the world without trade.

There may be more than a modicum of truth in the assertion that various British lines of production have not kept pace with competitors in other lands in efficiency of operation. Wars, however, certainly have played a very important part in bringing the problems of Great Britain to the fore. This is especially true of World War II. British production had to be shifted from civilian manufactures for domestic consumption and export to war materials. This shift reduced very decidedly the means for paying for imports. Moreover, available foreign exchange had to be used increasingly

for war materials. Liquidation of foreign investments provided added purchasing means for the time being but that process meant a loss of means of payment for imports later. Before the war, Great Britain lived on current production plus returns on accumulated savings. After the war, it has been limited largely to current production and part of that production necessarily has been directed to healing the wounds of war. The British people have had to deny themselves many things of foreign origin because they have been short of foreign exchange, especially dollars. They also have been forced to get along without some things of domestic manufacture because it has been necessary to push production for export rather than to concentrate on production for home needs. Clothing has remained short because woollens represented a commodity suitable for export. British cars have been going abroad rather than being sold to home buyers. In spite of this, the foreign exchange and domestic production have not been adequate to meet all needs. The limited supply of such important foods as meats and fats is one illustration of this condition. The "austerity" program in vogue in Great Britain rests on some fundamental dislocations rather than being something which has been hatched out in the fertile brain of Sir Stafford Cripps or something which can be laid at the door of the Labour Government. The austerity program, however, is only a way of living with a problem, not a remedy for it. The remedy lies in procuring the means for satisfying wants more fully through greater and more efficient production and its corollary, the recovery and expansion of trade.

The dilemma of Great Britain makes bilateral trading arrangements appeal to her as a way of getting out of difficulty, at least temporarily. One may grant the basis of such an appeal and still be concerned lest expediency be permitted to become the bricks out of which longer-run policy will be built. The employment of such devices may be contagious and the result may be that of fettering trade with so many of these arrangements that a return to anything resembling real multilateral trade may become a forlorn hope. If this should be the outcome, losses in terms of lowered levels of living and doubts over prospects for enduring peace might become staggering.

Americans who object to financial aid to Great Britain on the grounds that nationalization of some industries have taken place in that country need to recognize that the present Labour Govern-

ment did not create the basic conditions now calling for aid, and that from our standpoint what is done and how it is accomplished are much more important than who does the job. But it may be well to point out that on the other side socialization by itself will not automatically produce the changes required. Unless the British people and the British economy accept frankly the fact that lower levels of living will continue until a return to higher levels is earned by greater and more efficient production and trade, difficulties will increase. If the British people expect and demand returns that are not available from production, that nation like any other will soon find itself outdistanced by countries which face economic facts more realistically. The appeal of the "welfare state" lies in part on a concentration of attention on benefits rather than on costs. As a result the margin separating the "welfare state" from the "handout state" may be narrow. While some individuals may find it possible to get something for nothing, that is, at someone else's expense, a nation can hardly hope to do so for any length of time.

Great Britain attained its position of leadership in the world in a considerable measure because of its role in international trade. It is difficult to see how it can regain such a position without extensive restoration of multilateral trade. While the urgency of immediate problems fosters bilateralism, the British must share the concern of Americans over how to restore trade to a multilateral basis at the earliest possible time. To be sure, devaluing the pound and other steps necessary to a freer movement of goods internationally involve risks. This is what led *Fortune* (August, 1949) to ask, "Does Cripps perhaps really prefer bilateralism to risk? That is the key question about British policy and it is asked with growing insistence in Washington, in Britain, and in Europe." Those who view the risks as "intolerable" may do well to ponder the longer run consequences which may be expected to flow from a failure to face the present situation.

It would be unfair to imply that Great Britain is the only nation hesitant about taking the steps necessary to economic and trade recovery. The nations of Europe appear eager to pin their hopes on a future involving sales to their neighbors but less ready to adjust their own operations in accord with the basic principles of comparative advantage. Courageous and far-seeing action on the part of European nations generally is essential. The natural tendency is to

think primarily in terms of domestic and internal problems and solutions. It is difficult to take an optimistic view of European and world prospects unless effective action is taken to integrate economic activities. Perhaps it is too much to ask at this time for the establishment of a "United States of Western Europe" in its full political and economic import. However, it should not be asking too much of Europeans that they bend every effort toward restoring trade as well as production and that they face realistically and courageously such problems as those involved in achieving stable currency exchange relationships. Some Americans who are impatient with reluctance of Europeans to make needed adjustments contend that "he who pays the fiddler may call the tune" and insist that we should make compliance with the specific program we desire a condition of aid. However, if we prescribe the details of action, the program and the responsibility for its success or failure become ours rather than being cooperative.

While recognizing the importance of the attitudes and actions of other nations, Americans will do well to realize that our own actions, programs and policies may play an even more significant role in determining world trade policies of the future. As the world's leading nation, our concern over world peace and order is greater than that of any other nation. We have more to lose. Because of our position, our leadership is extremely influential. Recognition of this fact adds to our sense of responsibility. Self-interest focuses our attention on the need for export outlets in the years ahead and war helped to drive home to us our dependence on certain imports. The question of dollar shortage is prominent in international discussions of the day. The problem of dollar shortage is a consequence rather than a cause of international difficulties. It will not be overcome unless other countries can and will produce goods and services with which to obtain dollar exchange and those dollars cannot be obtained by them unless we stand ready to purchase goods and services from them. Our attitude towards imports, therefore, is a matter of prime importance.

The United States could not have developed as rapidly and effectively as it did if capital had not been available to us from other parts of the world. The shoe is now on the other foot. This country has reached the point where we have capital available for productive investment in other parts of the world. However, inducements for making such investments will be lacking unless there are good

prospects for obtaining and collecting returns on such investments through imports. This is a factor which we must bear in mind in our future trade policies. Our aim should be to do our part in helping develop a world of enduring peace, of stable governments, and of effective living together among nations, if we are to have the levels of living which resources make attainable for ourselves and for the world at large.

A common tendency is to think about our foreign and domestic programs as though they were separate and distinct activities which can be kept apart in water-tight compartments. This, of course, is not true. An important aspect of our policy with respect to foreign trade consequently needs to be a recognition of the fact that we cannot be unmindful of the effects which domestic programs may have on the rest of the world and our relations to it. Too many Americans appear to believe that what we do on the home front is strictly our business and consequently of no concern to anyone else. That view is entirely too narrow.

If we endeavor to maintain an artificially high price or wage structure here at home, it will be necessary to put up barriers to competition from other countries. The cry will go up that we must "protect" the American level of living and the American wage scale. It still is not recognized that levels of living and of real wages depend upon productivity, not tariff protection and trade restriction. We have difficulty in seeing in full measure the competitive problems created for other nations by our comparative skill and efficiency of production in many lines. It is anomalous for the United States under existing circumstances to be so fearful of trade.

There is direct conflict between our farm price support and our international policies. As long as we endeavor to maintain an arbitrary domestic price structure for given farm commodities, part of the program must be that of keeping imports from coming in to break down the scheme and bankrupt the treasury. Agricultural price support leads to production curtailment and Americans will hardly stand by watching imports come in while some of our most productive resources are kept in enforced idleness or devoted to less than their best uses.

The difficulties involved in achieving effective production curtailment result in the accumulation of surpluses of farm products when arbitrarily high price levels are maintained. A common assumption

is that a convenient and easy method of disposal for such surpluses lies in selling them abroad at whatever prices they will bring. This rests on the belief that there is a world market standing ready to absorb anything and everything we may see fit to turn loose on it. Such an assumption is most unrealistic in the present-day world. It overlooks entirely the knotty problem of dollar shortages. It does not face up to the vast array of trade barriers found in the world today.

Selling products abroad at less than their domestic price is a form of dumping. The nations of the world, including the United States, have restrictions against this practice. We have been quick to employ countervailing duties when products were dumped on us to create situations which we viewed as unfair competition for our own producers. Aside from that difficulty, a question also may be raised with respect to the soundness of a policy which aims to provide others with our products at lower prices than those charged our own consumers. This seems to be a doubtful way to safeguard American levels of living.

Moreover, any program involving dumping of American surpluses abroad to maintain an artificial price structure at home is inevitably nationalistic in nature. As previously suggested, barriers will have to be raised to keep foreign products from sharing in those artificially high prices. In addition, barriers will become necessary to keep dumped products from returning to our markets. This includes not only raw materials but products made from them. For example, if we dump cotton, it must be kept from making the return trip and in addition our textile industry will demand protection against foreign competition on the grounds that cotton mills abroad get American cotton at a lower price. Any extensive dumping of food products will lead to widespread demands for higher trade barriers on the grounds that foreign competitors have an advantage in resulting lower living costs for their workers. Americans have not yet faced frankly the inherent conflict between our programs of price supports and our international policies. This observation also applies to some of our officials and legislators who are bringing forth proposals involving price support.

Perhaps it will be suggested at this point that international commodity agreements provide the solution for this dilemma. While there is room for questioning commodity agreements, one is not justified in going so far as to say that there is no opportunity

at all for their employment. For example, if nations with food or other supplies to spare get together on a program of sharing these supplies with backward nations having need but lacking means of satisfying such need, the program may be very much worth while both on humanitarian grounds and as a way to improve productivity. But the possibility of using commodity agreements for such laudable purposes should not silence us in raising questions regarding other types of such agreements. Have we given sufficient consideration to the nature and consequences of these agreements? We apparently dislike and distrust cartel arrangements but are not some of the proposed international commodity arrangements glorified cartels? Markets are to be divided, rights to supply and share are to be assigned, and price limits are to be established. Will not such arrangements tend to encourage further encroachment by the state in the actual handling of trading? Will they require government controls of supplies and production to make them effective? Will they help or hinder desirable adjustments of production and of trade arrangements? Are we not selling commodity agreements to export nations on the argument that they assure a market and to consuming nations on the grounds that they assure them a supply, without sufficient examination of the consequences of such arrangements on the international trade picture and the relations of governments thereto? Surely, these questions are of sufficient merit to have our most careful study and attention before we embark on a program involving extensive reliance on commodity agreements.

Pressures being put on ECA and proposals in Congress relating to the uses of funds made available to it indicate a disturbing trend in our thinking. One of the favorite ways employed by enemies of the European Recovery Program in attempting to discredit it has been to charge that its major purpose is that of bolstering the economy of the United States by creating markets for surpluses. To the extent we yield to these pressures, we will give substance to those criticisms. Any such development is certain to create grave doubt and suspicion in the minds of others regarding the sincerity of our purposes. It will weaken our effectiveness as a leader.

If the ERP is to accomplish its objectives, the funds must be husbanded for use in purchasing goods which are most essential for economic recovery and for reestablishment of more normal

interchange and not be misappropriated to provide outlets for products merely because they happen to be in surplus in an artificially rigged domestic market.

Research in marketing is a center of interest at present. Surely, international trade is of such importance to our future that basic problems relating thereto are deserving of a prominent place among the subjects selected for study. In the work now under way, we are giving more attention to finding immediate markets abroad than to a fundamental study of what is needed for the development of permanent markets. Do we have an adequate picture of what international trade will be like after ECA completes its operations? What kinds and amounts of products may we hope to export? What will our import picture be like? How may we meet and solve problems of dollar shortages, establish stable foreign exchange relationships and restore convertibility of currencies? What are the requirements for and problems involved in a return to a greater volume of multilateral trade? What are the international ramifications of various domestic programs and proposals? Further light on these and a host of other problems is needed as guides for both our foreign and domestic policy.

An observation which a discussion of the preceding type may be expected to evoke from some quarters is that the views here expressed arise from a nostalgic longing for a return to the days of yore. But it is not a case of going back to something but a question of what we are going forward to. If we are to be fatalists and assume that the peoples of the world can do nothing to alter the stream of events, then we might as well fold our hands and wait for the worst to happen. Few of us will subscribe to any such defeatism. We will instead recognize that we can do something about shaping the course of future events and that it behooves us to study problems and consequences carefully in order that we may act intelligently. Only to the extent we do so will the future bring a satisfactory answer to the question "Foreign Trade Policy—Which Way?"

SOME FURTHER WORLD TRADE PROBLEMS—A REVIEW OF PROFESSOR JESNESS' PAPER

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PROFESSOR Jesness points out that there are two roads ahead of us in foreign trade policy, an easy but purposeless road marked expediency, and a more difficult road which appears to backtrack but, he assures us, will lead to a great plain of multi-lateral trade and stable world relationships. A dozen years ago we were faced with a similar choice, yes, and even two dozen and three dozen years ago. Is it any easier with today's vast proliferation of trade restrictions to choose the high and difficult road of reduced trade barriers? Can we be any more hopeful now that domestic and international prices can be brought together?

It is appropriate to diagnose the illnesses of free multilateral trade. Why did it break down? Professor Jesness has mentioned two wars and a depression, but let us be more specific. First, and of prime importance, is the impact of the international business cycle, with war important in affecting one phase of the cycle. Many, many restrictive measures were adopted in efforts to limit the extent to which deflation affected a particular country—an export-the-depression sort of phenomenon. Second in importance are the secular changes in the conditions of consumption and production frequently becoming most serious in a depression. Examples would be the gradual expansion of synthetic fibers substituting for cotton or a continued rapid increase in rubber production while consumption increased less rapidly. To counteract such effects, interferences with trade such as the Stevenson Plan and the International Wheat Agreement were enacted. Third is the fear of war and food shortages and consequent willingness to accept nationalistic programs of self-sufficiency. Fourth are the efforts of one group or another to improve its price and terms of trade relative to other goods and factors through using tariffs, quotas, and the whole array of other restrictions. We tend to think of the fourth and forget that the other three frequently have set the stage so the fourth could operate. Trade restrictions are not solely the result of the activity of selfish pressure groups.

Is there anything in the present international situation to give us hope that these same forces will not once again draw the curtain

on our efforts to reestablish multilateral trade? Are we even making progress towards developing ideas and institutions attacking these problems? The business cycle is an important key to the whole situation yet none of the specialized international agencies has the cyclical problem as its major obligation. We are operating on an *ad hoc* basis attempting to attain stability primarily through price on a commodity by commodity basis without really facing the main issues. At one stage, the ITO charter gave some consideration to it but in the final version, the wording was watered down to innocuous form, in spite of the protests of Great Britain and other European friends.

I would like to suggest that it is high time we do some exploratory analysis based on the assumption that domestic price support programs will be with us for a long time to come. Therefore, it behooves us to try to chart a better road, and to put some purpose in the general direction of expediency, at least to learn more about the several alternatives along that road. It is possible that such mapping will discover a circuitous but perhaps politically easier route which eventually approaches the plateau of multilateralism.

A major contribution the United States can make to a long time sound world order is to maintain a stable and relatively high level of employment and purchasing power. The analysis of this problem requires a kit of tools and a body of doctrine which has not been well-integrated with the traditional neoclassical theory and hence has little to say about efficient international resource allocation. Many, of course, claim greater realism for this Keynesian analysis. It is easier to develop programs to deal with the business cycle on a national level, and such programs will not necessarily mesh with policies striving to make the international price system function; in fact policy may be developed more easily if the various national price systems are partially insulated from each other. There is much to be gained by focussing on policies which have the maximum international counter-cyclical effects rather than on international allocation of resources. International investment, for example, in many ways has been an upsetting rather than an equilibrating influence. It is questionable whether free international trade, the free flow of investment and full employment are mutually compatible within the framework of our present economic institutions. There is a tremendous waste of resources in a depression, and the world could well afford a little

mal-allocation of resources if a depression were thereby prevented. It would, of course, be better to avoid both.

Let me digress for a moment. In analyzing American agricultural policy at the domestic level, many of us have found it exceedingly useful to separate the two problems of resource allocation and income distribution. Income goals have been used to sell programs to Congress and to the people, programs which gain their objectives through modifying resource allocation. By separating these two problems far more rigorous analysis is possible, which frequently leads to pertinent suggestions for the improvement of programs. The study of resource allocation in agriculture is the heart of our field of work. To make policy conclusions in this area the main assumption is that people prefer an efficient combination of resources to an inefficient combination, a relatively easy assumption. While resource allocation affects income distribution, we have found it desirable to study income distribution separately and later to put the two together. The assumptions necessary for policy conclusions with reference to income distribution are more controversial. Usually we do not come to an agreement, but rather limit our disagreement by attacking only the extreme variations in income which are socially unacceptable.

You are all familiar with the conclusions arrived at by these methods of analysis. Agricultural and other public programs should function in such a way that the price system can operate effectively in its proper role—that of allocating resources in relation to the values of the marginal products. A considerable variation in the personal income distribution may result, but in general, the net social product is maximized. If this resulting income distribution does not fit the pattern that society deems desirable, other measures are suggested to redistribute the social product. Progressive income taxes, public education, and relief measures are well-known examples of such measures, with direct payments a more recent addition.

In the international field we have not really applied this two way analysis rigorously. Attention has been concentrated on the allocation of resources, and on somehow reestablishing the international price system. But in the last two decades, we have seen how all nations have been unwilling to permit the price system to function, primarily because the resultant distribution of income between nations and within nations was unacceptable to them.

Various steps were taken in attempts to improve their income situation, even though many recognized that the net world social product was thereby diminished. Yet, in our analytical work, we have unconsciously said, "Whatever international distribution of income results from efficient international resource allocation is a desirable and proper distribution." If the rubber producers of Malaya find the price of rubber declining from 25 to five or 10 cents per pound, they will be strongly tempted to limit marketings so as to raise prices and maintain incomes. The classical free trade answer opposes this and suggests that other lines of production should be developed. The long-run world social product would be maximized. To the rubber producer this is no answer at all since rubber is his source of income. Farmers, laborers, and others have refused to accept such *dicta* on the national scene; we can hardly blame nations and policy makers for rejecting it internationally.

Studies by Colin Clark¹ suggest that the differences in national income between industrial and primary producing countries are becoming wider. Yet we have not developed any institutions specifically designed to deal with this problem. We have adopted measures which change the international distribution of income, some consciously and others unconsciously. Professor Jesness mentioned Lend-Lease, UNRRA, and the Marshall Plan, which, through exporting food and capital goods divert income from American to foreign recipients. But we have been telling ourselves that these were loans or temporary measures until reconstruction has been largely completed. Affecting income distribution in the reverse direction are the price support programs which we and others have put into practice. Assume for the moment that such a program in the United States supports wheat at 25 cents above the equilibrium price. Within the probable elasticities of supply and demand in the short run, income is transferred from the wheat-consuming to the wheat-producing countries including ourselves. In the long run changes in resource allocation would expand wheat production in most countries, and income would be transferred from wheat importing countries to wheat exporting countries or from wheat consumers to wheat producers in the foreign consuming countries.

It is interesting to discuss the effects of an export subsidy by the

¹ In *Conditions of Economic Progress*. See also T. W. Schultz, *Food, Agriculture, and Trade*, this JOURNAL, February, 1947.

United States of exactly 25 cents per bushel. Under the circumstances above, it would neutralize completely the effects of the domestic price support program on international resource allocation and on international income distribution. An export subsidy such as this would keep the price support program entirely within the United States, except as wheat farmers in the United States might spend their additional income differently for imported goods than those who would otherwise have received the income. Thus if we assume a continued price support program probable, we find a role for the export subsidy. However, foreign nations would still consider the 25 cents to be an export subsidy against which retaliation would be justified. And obviously it would be difficult to determine the exact amount needed to offset domestic price programs, or once in operation, to keep such subsidies from becoming several times the amount needed to neutralize them internationally.

These considerations suggest that we need to face squarely on a multilateral basis the questions, "What sort of international distribution of income is socially desirable? How far and in what way can the United States contribute to this desirable income distribution?" We and other nations have an income tax designed to redistribute income among the people within our national boundaries. Logically, is there any reason why this redistribution should stop there?

We must recognize and deal with programs such as the now discarded Brazilian valorization of coffee, the West African Cacao Marketing Boards, or our own agricultural programs. If we were prepared to consider supplementary world income programs on a permanent basis, it could ease the problem of providing for a more efficient international distribution of resources. In the main, the United States has avoided using its economic strength as an international political weapon. If we were to pass a tariff on coffee, cocoa, and other tropical agricultural products to be applied as other countries discriminate against our goods, this bargaining weapon could be very effective in limiting the efforts of many Latin American countries in subsidizing competitive agricultural and industrial development. But such a weapon is dangerous and if unsuccessful, would end by increasing the price American consumers pay for these imported goods. Furthermore, as Professor Jesness points out, such bilateral trading does not serve us well with our major customers in other areas. A safer weapon though still sub-

ject to considerable dangers of political manipulation and favoritism and to legislative criticism, would be an income supplement between nations recognized as such. Such income supplements might operate through any of the familiar foreign aid programs already in operation but all integrated on an international basis and across commodities to move toward definite specific goals of social action; and made conditional upon positive measures for freeing the international price system of its many restraints and thus leading to better international resource allocation. Under the European Recovery Program it is in precisely this way that much of the progress in reducing European trade barriers has been made.

Clearing a road such as suggested is fraught with danger. Yet if, in spite of our efforts to turn into the high road proposed by Professor Jesness, we do continue in the zone of expediency we need to at least explore the criteria by which a better course can be charted. The existence of surplus supplies and the embarrassment of a government agency is certainly not an adequate basis for determining what to sell. But unless other criteria are developed, these are the ones which will be used. There are difficulties involved in determining what would be socially and internationally accepted as an improved distribution of income (it is not necessary to determine the ideal distribution). Areas where population is at or close to the Malthusian level would need to be handled separately. However, if by using direct payments of some type it would be possible to decrease the desire of most nations to warp international trade to their own advantage, positive gains would occur in total production as world resources were used more efficiently. These will repay part or perhaps all of the subsidy. The expansion in production plus the income supplements could become a powerful impetus leading toward a better world order, leading us by a circuitous route to the plateau of multilateral trade.

In bringing these ideas together, the following items seem worthy of consideration and further discussion.

(1) It is imperative that the cyclical problem be settled before any real progress can be made toward efficient international trading. Otherwise the first sign of a depression will be the signal for the intensification of quota and exchange controls either within or outside the ITO.

(2) Specific attention should be given to the problem of desirable world income goals on a multilateral basis. All existing inter-

national programs and possibly new ones would need to be revamped into an integrated program leading towards definite long time goals and not a series of separate and conflicting ends.

(3) Domestic agricultural programs in the United States should not operate to tip the terms of trade to our advantage. This, of course, assumes that the United States is at the top of the heap as far as income is concerned, and can afford to give up any measures which further increase its differential advantage.

(4) International programs should have a minimum effect in directly influencing resource allocation, but should be made conditional upon moving towards the elimination of existing wholesale interferences with international trade and the international pricing system. A difficult problem in such a program is maintaining international self-respect and continued efforts on the part of individual nations toward solving their own problems. Great Britain is a case in point.

I concur fully in the desirability of the goals and conditions of trade which Professor Jesness discussed as long time resource goals. We have made tremendous progress in the United States in our attitude towards international trade, yet in the world as a whole there is ample evidence of a less than wholehearted acceptance of the ideas of trade. The International Trade Organization has not been fully accepted. Considerable unrest is being generated as one industry after another here and abroad begins to feel the impact of the tariff cuts negotiated at Geneva. It is time to try some different techniques to lift ourselves from the morass of restrictionism into which the world has sunk. The road I suggest exploring leads dangerously close to the swamps of wholesale state interference in trading. If we lose our footing we may be worse off, but if successful, we will find that we have made real progress towards reestablishing a world trading system on a basis which has a larger measure of permanence. If we are to progress towards free trade, it is essential that we attack the problem of income changes over time and the problem of income differences between nations. Lacking this, the next economic crisis is likely to add further to the array of devices used in restricting trade.

FOREIGN TRADE PROBLEMS—FURTHER COMMENT

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CAN the United States fulfill its avowed determination to establish world conditions conducive to a high level of multilateral trade? The Ægean stable of world trade is still heavily laden with exchange controls, import quotas, export subsidies, bilateral agreements, unbalanced trade, and restrictive internal economic policies. Notwithstanding our notable postwar extensions of foreign aid, the creation of the International Trade Organization and the world bank and monetary fund, the task which we have assumed remains truly Herculean.

In assaying this task and considering the signposts ahead, it appears essential to review a few postwar trends and current factors in the foreign trade picture. The United States has invested heavily in postwar world reconstruction and recovery. Government grants and credit extensions between July 1, 1945 and the end of 1948, totaled more than \$20 billion, approximately half the total being in each category.¹ Leading recipients of this aid included the United Kingdom (\$5.4 billion), France (\$2.8 billion), Germany (\$1.8 billion), Italy (\$1.4 billion), China (\$1.6 billion), and Japan (\$1.2 billion). The goods and services represented by these grants and credits contributed notably to the rapid recovery of production in many countries. However, they were insufficient, when combined with the exports of the recipient countries, to balance the cost of heavy import requirements of these areas. Consequently, foreign gold reserves and short-term dollar balances, other than those of the U.S.S.R., decreased an estimated four and one-third billion dollars during the two years 1947 and 1949 and now are down to an estimated total \$14 billion.² By the close of 1948, several countries, fearful that heavy gold and dollar drains would shortly jeopardize their limited internal financial stability, tightened import restrictions. This action was largely responsible for the reduction of United States exports of goods and services from almost \$20 billion in 1947 to \$15 billion in 1948. United States imports of goods and services, on the other hand continued to rise in 1948 and the net United States balance on goods and services

¹ This aid included \$10,471,000,000 in grants and \$9,668,000,000 in the form of loans and credits. Source: Clearing Office for Foreign Transactions, U. S. Department of Commerce.

² *Federal Reserve Bulletin*, May 1949, p. 485.

account dropped from the \$11.3 billion high point in 1947 to \$6.3 billion in 1948. United States credit advances and donations, governmental and private, accounted for all but \$100 million of the foreign trade balance deficit in 1948. This trend of events has continued on into 1949, as many of our leading customers seek non-dollar requiring sources of supply or bilateral balancing agreements. About one-third of our reduced exports are made possible by credit and donations to our customers.

Several writers at home and abroad have expressed some satisfaction with the strident effort of foreign areas to balance their dollar accounts.³ At best, this is a short-run adjustment to meet the current crisis and in no sense solves the longer-run problem of increasing the volume of world trade and creating conditions approximating international equilibrium.

Looking ahead several important and closely related questions must be raised. Is the world dollar shortage to continue as a chronic brake on world trade? Are United States imports about to level off or will they continue to expand and thus contribute to the solution of the problem of international trade stability? Will United States credit policies meet the needs of the world in the decades ahead or will we increasingly restrict our assistance to military aid and economic advice? Can internationally administered exchange rates be effectively managed so as to stimulate world trade? Can internal economic policies, at home and abroad, accomplish high level employment and production and also be consistent with an expansionist foreign trade policy?

There exists a remarkably close historical relationship between imports and industrial production in the United States.⁴ Although on the increase, our imports of goods and services are probably \$2 billion below the level which could be expected, given a continuation of the United States import-national income ratio of the past, and United States industrial production and national income at their recent level. Limited foreign production of goods and services complementary to the United States economy during the first postwar years, and United States import restrictions have largely shared the honors in holding down United States imports. Assuming that our present economic adjustment does not carry

³ Dembity, L. N., and Hirschman, A. E., "Movement Toward Balance in International Transactions of the United States," *Federal Reserve Bulletin*, May 1949, pp. 480-488.

⁴ *The United States in the World Economy, 1943*, United States Department of Commerce, p. 39.

our real income much below the present level and that it will subsequently rise, and assuming further that we will continue to relax import barriers, especially quota restrictions, the prospect for expanded imports appears reasonably good. To the extent that such a development takes place, the need for future donations to foreign areas will be reduced.

If properly timed and skillfully adjusted, changes in exchange rates may well encourage trade expansion and foster conditions of international equilibrium. The charter of the International Fund makes quite clear the intentions of the member countries to collectively employ exchange rate adjustments in support of foreign trade equilibrium without impairing the level of economic activity in the separate economies. The fact remains, however, that appropriate and mutually acceptable exchange rate adjustments remain a highly complicated task. The United Kingdom resisted devaluation of the pound in the postwar years in spite of pressure to effect the adjustment. While world markets were strong and readily accepted the total of Britain's exportable surplus, she had nothing to gain from deliberately worsening her terms of trade. With expanding output and softening world markets the British Government and officials of the monetary fund must still carefully evaluate the nature and degree of disequilibrium, the elasticity of demand for United Kingdom exports, the elasticity of imports, and the cross effects of prompt devaluation of many other currencies which followed the downward adjustment of the pound. It is more than likely that the demand for United Kingdom exports and the United Kingdom demand for imports are relatively inelastic, at least in the short run. Assuming that a moderate or substantial devaluation of the pound might give some aid to the hard pressed British economy, it would not likely solve her major problems, including high cost of power and raw materials and production inefficiencies.

The time is here when members and staff of the International Fund must demonstrate the ability of that organization to contribute to monetary conditions favorable to full and stable international trade. It must be realized, however, that the Fund is not equipped to solve all or even the major problems barring the path to international equilibrium. The first prerequisite to high level and balanced trade is a high and sustained level of economic activity in the principal trading nations of the world. An important element in achieving expanded production at home and abroad during the

next decade or two will be the foreign lending policy of the United States. The fact that United States loans and credits abroad during the last four years totaled no more than \$10.5 billion must be attributed in part to the fact that our donations were roughly equivalent to that figure. Sharply expanded United States foreign loans during the next decade or two would offer at least the following gains:

1. Remove foreign reliance on United States Government donations by 1952.

2. Alleviate the current and prospective balance of payment crises more or less chronic in a number of important trading countries, and reduce the time until the dollars, pounds, francs, lira, and other currencies of the world can be freely converted. This development would free Canada and many other countries from an extremely serious balance of payments problem which in turn jeopardizes their internal economic stability.

3. Give necessary support to the United States policy of exporting technical know-how. The fourth point in President Truman's inaugural address, the so-called Bold New Program, if thus carried out in truly bold fashion would enable many underdeveloped countries to sharply expand their efficiency and level of output. This in turn would go far toward assuring an unprecedented level of international trade.

4. Create a sustained and high demand for United States industrial and agricultural products which are geared in production for a world market.

5. Stop the strong present trend toward bilateral trade agreements. An adequate supply of dollar exchange would no doubt go far toward removing the incentive for bilateral trade and exchange clearance. Such loans may well come from both governmental and private sources to the extent of \$5 billion to \$10 billion a year. A broadening of the Charter of the International Bank for Reconstruction to enable that institution to manage such increased credit activity may be the most desirable step.

At this point I would like to pay brief respects to United States farm policy and its relation to our expansionist foreign trade policy. Support price and export subsidies are in obvious conflict with our goal of increasingly unrestricted multilateral trade. A shift of United States farm programs away from support prices to farm income support would resolve in large measure this fundamental inconsistency. If, however, the political roots of farm prices sup-

ports are deep, an early and full solution of this problem does not appear in the offing. The implications of price supports as they impinge on foreign trade policy is strikingly exemplified in a recent potato incident. The United States granted Canada a three and one-half million bushel potato quota as a part of our reciprocal trade understanding. As these potatoes came into the United States and benefited pricewise from our support price program, American potato interests lodged strong objections. The political pressure became sufficiently strong to induce the United States government to ask the Canadian Government to release us from our quota commitment. Such procedure must shake the faith of other countries in our ability to carry through on our trade commitments. Export subsidies likewise invite retaliation and bode no good for liberal trade objectives. However, to the extent that international commodity agreements cover basic commodities, to which United States subsidies are commonly applied, the major foreign objection to subsidies may be removed. In fact export subsidies become an essential feature of the program when, as in the case of wheat this year, the United States support price is above the maximum price provided for in the international agreement. Whether or not the wheat and other agreements will serve to expand trade and effect a distribution of the world's production along comparative cost lines remains to be seen. In the event of sharply declining prices and apparent excess world stocks of agreement commodities, there will come a severe test of this technique for avoiding the collapse of prices and, even more important, avoiding the uneconomic policies which were commonly applied to basic commodities in many countries during the 1930's. In light of the basic commodity market experience of recent decades and the uncertain status of international trade at this time, international commodity agreements could well be more hope than menace for future trade and economic peace.

Economic policies designed to encourage a high level of balanced foreign trade can contribute greatly to the material well being of this and other countries as well as economic and political peace in the world. Have we in the United States the collective wisdom and courage to continue and augment the world leadership which we have assumed in the realm of international economic policy in recent years? It appears not altogether unreasonable to assume that we do and in this, there is hope for the future.

IMPLICATIONS OF PARTICULAR ECONOMICS IN AGRICULTURAL ECONOMICS METHODOLOGY*

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THERE are two kinds of specialists in any field of science. One is the "tool-maker," who develops fundamental principles. The other is the "tool-user," who applies fundamental laws to specific problems. In economics the theorist is the "tool-maker" while the agricultural economist is a "tool-user." Obviously, it is also desirable that "hybrids" exist or that the "tool-user" stop to fashion tools which are needed but are not available.

Agricultural economics is simply economics applied to agriculture. It draws upon economic theory for its basic laws and analytical models. Few if any laws have emerged from empirical research in agricultural economics which were not already explained by or implied in the logic of economic theory. Economic theory, like all the theoretical sciences, is a deductive science. The deductive theorems of pure economics are the hypotheses or models to be subjected to empirical test in the various phases of applied economics.

It should be emphasized, however, that the important relationship of theory to applied economics is not one of simply developing new theorems to be proven or refuted by empirical analysis. While useful and necessary, this step can be one of idle curiosity. Theory should not be looked upon as an end or an art in itself. Conversely, the function of applied research is not solely one of searching out new models and theories in pure economics to be duplicated in or refuted by empirical observation. The important relationship is instead one of selecting an important problem in life and then drawing upon the appropriate model which provides the logic underlying the theoretical solution and suggests the pattern of empirical observation.

The important contribution of theory to empirical study can best be visualized by outlining the five fundamental steps in empirical research and the part that analytical models play in each.

I. *Formulating a problem.* A problem can be defined in either of two related but yet distinct manners. (a) *In terms of the doubt,*

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confusion, or uncertainty that faces individuals or society. Here a problematic situation is ordinarily identified through the expression of felt difficulties by individuals or groups. Problems delineated in this fashion are of the practical sort (although no more important than those outlined under b) and ordinarily call for immediate solution.¹ (b) *In terms of departure from ideal or optimum conditions.* This method of problem formulation might be termed the "normative" approach. The equilibrium conditions of economics serve directly in identifying and outlining problems. Equilibrium explains the conditions under which a given end is maximized or fully attained.² Deviation from this ideal or optimum (relative to a given end) is indicative of a "problem." The solution lies in determining the reason for deviation of the *existing state* from the *theoretical (or empirical) optimum* and explaining the means of moving from the former to the latter.³

Obviously, there is a great deal in common between the *confusion* (a) and *equilibrium* (b) methods of problem formulation. Individuals or groups express doubt or uncertainty about the *existing order* because it departs from a state which they believe is the ideal. In this vein the two methods are identical. Certainly, a great many significant problems are "uncovered" in this fashion. However, under the *confusion* method the problem is present before it is recognized. Identification of problems by means of ideals or optimums more nearly allows their anticipation and solution before the crystallization of a "problematical" situation by the public.

II. *Formulating hypotheses.* Given a problem, the most important

¹ The two concepts of a problematical situation are more nearly identical if the "confusion," "doubt," or "felt difficulty" is in the mind of the research worker rather than conveyed to him by other individuals. Emphasis is on the fact that economic theories or models delineate problems in and of themselves. The body of theory acts both as a stock of (a) calipers for indicating problems and (b) hypotheses for their solution. The important reason that these "convenient tools" relating to real life problem are available is simply because in the past they have been developed to solve real economic problems which faced (and continue to face) individuals and society. In physical sciences some of the more important discoveries grow out of abstract notions of an optimum which is not attained (in contrast to a direct expression of a problem by individuals other than the scientist.)

² The relativity of means and ends should be recognized at this point. Ends in economics are often not ultimate ends but only intermediate ends—ends to be attained only as means to more nearly ultimate ends. In this vein, the ends which we mention here need not be ultimate ends. Too, our use of the term "normative" refers to the ideal expressed by maximization of this end (whether it be intermediate or ultimate). It does not refer to "what ought to be" in an ethical sense.

³ Research is of ultimate social value only as it provides answers for this step. This is the "policy" recommendation. It is equally important for individual firms, individual consumers, and society.

step in research is formulation of hypotheses or theoretical solutions. Herein lies the design of the entire empirical procedure. Again, it is the general or basic laws of any science which function as models and hence provide hypotheses which guide the various empirical phases of investigation. The use and adaptation of theoretical models is one of the most neglected steps in empirical research. Without a theoretical solution the probability is small that one will be found in reality. In a practical vein an analytical model can be looked upon as a mental picture of the relationships (qualitative and quantitative) involved. The model also suggests conditions which must hold for maximization of a given end and thus indicates the kind and quantity of data necessary for its solution. Models are employed in all sciences and may be of either a physical or a mathematical or abstract type.

III. *Designing empirical procedures.* This step includes specification of (1) the evidence needed, (2) the statistical techniques to be employed, (3) the design of the sample or experimental method, and (4) tests of significance (or bases under which the hypotheses will be accepted or rejected). These aspects of empirical procedure should be decided upon before data are collected (in contrast to a common sequence whereby data are assembled and then questions of the appropriate statistical technique are examined). Yet these are given automatically once the analytical model is specified in step II. The appropriate statistical technique is given once the applicable model (hypothesis, theory) is formulated. In turn, the appropriate (a) sample or experimental design and (b) test of significance is given once the appropriate statistical technique is determined.⁴

IV. *Assembling and processing data.* This step is largely routine. It involves implementing the thinking which has taken place in steps I, II, and III through selecting the sample, devising a ques-

⁴ If the model involves functional relationships, as in economics, it specifies (1) use of regression analyses as the appropriate statistical techniques which in turn specifies (2) a sample stratified by the independent variable and (3) tests of significance of (or between) regression coefficients. If the model involves discrete populations and attributes it implies (1) use of means and frequency distributions as appropriate statistical techniques and hence (2) a random sample and (3) analysis of variance or chi square as tests of significance. A model indicating a closed system and a simple relationship between a dependent and independent variable would specify a single-equation, least-square regression analysis. A model indicating a system of interacting economic forces and jointly dependent variables would specify application of simultaneous equations.

tionnaire, enumerating data, etc. Too much research is initiated with step IV (data collection is substituted for thinking).

V. *Interpreting findings.* Interpretation of findings requires both statistical (mathematical) and economic analysis.

The important role of analytical models in applied research is now apparent. They provide imagination at every turn and function to systematize problems, express hypotheses, and outline empirical procedures. These elements of investigation are not distinct but flow simultaneously from single models. Greater recognition of (1) the fact that economics is the basic science underlying agricultural economics, and (2) the role of the appropriate analytical tools in empirical procedure would do much to systematize empirical research methods and findings. There is evidence that economic studies are made in agriculture without recognition of the relevant economic relationships.

Scientific Objectivity

The role of theory can hardly be restricted to use as a guide in empirical research. There are numerous economic problems where little foundation exists for empirical analysis. In some instances appropriate models have not been developed. In others, the complexity of the models is too great for currently available statistical techniques. The impossibility of quantitative observation or control of phenomena also is one of the more important conditions which excludes their application to empirical material. Then, too, there are areas in which the logic of economic postulates is obviously valid and needs no empirical verification even though it be possible.

Finally, perhaps the most important problems in life must be "solved" without empirical data. We cannot wait to "let the facts speak for themselves" simply because all the facts will never be available. Quantitative data are not available for telling farmers how to combine each infinite unit of resources. Nor are they available for fashioning a "perfect" national policy. Economic logic rather than empirical analysis must provide the guide in the *greatest number* of individual and national economic problems. Economic principle provides the vehicle whereby scientific objectivity can be attained even though the analysis must be in terms of systematic logic.

To be certain, empirical research is not always free from bias, personal evaluations and distorted inference. "Facts" are frequently

more open to bias than mental deduction. However, disagreement between "facts" can always be resolved by further observation and refined statistical treatment. Resolving conflicts is not so simple where analysis is possible largely or only in the form of scientific deduction. Yet scientific objectivity is possible even here; findings can have interpersonal validity in the sense that (1) two or more individuals analyzing a given problem can arrive at mutually consistent solutions, and (2) the *analysis* of any one individual is apart from his own personal beliefs, judgments, and values. The role of economic principle in guaranteeing scientific objectivity can best be visualized by reviewing the major conditions which give rise to conflicting solutions: (1) *The investigator does not employ systematic logic or deduction in his analysis but instead generalizes from isolated personal experience and judgment.* The difficulty here is not that the individual attempts to incorporate his own system of values into the analysis but that he fails to employ scientific thinking or the rules of logic. Personal experiences are valuable in formulating hypotheses. However, "hunches," "beliefs," or "judgments" based on a "restricted sample" seldom provide the basis for broad generalizations. The underlying assumption here is always that the "conditions" surrounding the "experience" are identical with the "postulates" of the problem in hand. (2) *Problems are defined in respect to different (levels of) ends.* Disagreement in solution may arise because investigators do not define their problem relative to a given end in the means-end scale. For example, in the economics of the individual, one research worker relating his problem to the end of *profit maximization* (an intermediate end) may rightly suggest that the farmer work more hours, use his labor "more efficiently," and hence increase income. A second investigator, relating his problem to *utility maximization* (a more nearly ultimate end), might correctly recommend that the farmer do less work and utilize labor "less efficiently" if the utility sacrificed through a decrement in money income is less than the increment in utility gained from working fewer hours. Disagreement in findings arises here not because the investigators (a) fail to employ scientific logic or (b) introduce personal value or bias, but rather because the problem is defined relative to different ends. (3) *Analysis is in terms of the individual's valuations or vested interests.* Research workers, like other individuals, are members of specific social and economic groups; they are Democrats or Republicans, farm owners

or salaried workers, investors in sheep ranching or stockholders in synthetic textiles. Further, vested interests also grow up and are perpetuated in universities and other educational or scientific organizations. These various conditions expose investigators to influences other than pure scientific objectivity. Economic policy analyzed and evaluated by individuals in terms of their own interests and norms necessarily leads to varied conclusions. Lack of agreement here grows largely out of conflict in ends at the same level in the means-end hierarchy.

Economic theory provides a common logic whereby scientific objectivity and interpersonal validity of conclusions can be guaranteed even in the absence of empirical analysis. The laws or theorems of economics are deductive set of propositions derived by the rules of logic from basic propositions called assumptions or postulates. It is these laws which fashion patterns of uniformity into a coherent system. However, since alternative hypotheses or theorems are possible, depending on the underlying postulates and the end which serves as a frame of reference, mere application of economic theory is not a sufficient condition for attainment of mutually consistent solutions. It is also necessary that (1) the problem be defined relative to a given end and (2) the underlying assumption and postulates be stated and reconciled.⁵ Accepted economic principle provides this framework for interpersonal validity of findings.

Branches of Economics

Two main branches of modern economics are "microeconomics" and "macroeconomics." Microeconomics deals with particular firms, particular households, particular industries; the price, demand, or supply of specific commodities; the productivity of or returns to specific resources and other individual relationships and quantities. It includes an important portion of marginal analysis and also considers interrelationships of particular units in describing the economic system and outlining optimum economic organizations. Macroeconomics is a study of composite economic quantities.

⁵ The "end" need not be consistent with all investigators' personal values or beliefs. It is also irrelevant whether the "end" is an "intermediate end" (means) or a more nearly "ultimate end." It is only necessary that the problem be defined relative to a *given end*. Science is concerned only with this definition of a problem (irrespective of whether the problem is important as measured by other criteria). Science is unconcerned with the end *per se* but rather, given the end, is concerned with deductions relative to the end.

It is concerned not with individual prices, commodities, industries, or households, but with such aggregates as the general level of prices, the level of employment, or the national income. Macroeconomics is especially important for certain crucial economic and policy problems given, not in individual, but in mass phenomena. It is also claimed that in aggregation the maze of individual facts and relationships can be reduced to a few variables and relationships with a greater adaptation to statistical treatment. Conversely, there is much to be claimed for the application of microeconomics. Often the particular relationships between phenomena have greater significance than the composite aggregates of which they are part.

Microeconomics has a wide range of application, especially in agricultural economics, where it is often the particular relationship, quantity, or organization which is the focus of investigation. A greater quantity of research in agricultural economics has been based upon micro than on aggregative models. However, the demarcation between particular and aggregative relationships is not as distinct as supposed when certain conventional empirical procedures are employed. *First*, while the objective often is to predict intra-unit relationships, these relationships are based on inter-unit observations. In a farm management study the analysis may be one of the relation of returns to scale. However, the empirical data is obtained not by varying the scale of one firm and observing returns within it but by observing returns for firms of different scale. Similarly, in estimating a demand curve, observations are obtained not by varying prices in a *given market* (wherein national income and other aggregative economic quantities are constant) and observation of the quantity purchased under each but by obtaining observations from *many markets* over time. The relationships derived from inter-unit data are often of an aggregative character and may not be duplicated within a unit. Given cross-sectional observations, joint relationships between variables and the aggregative character of the quantities, alternative theoretical models and empirical techniques often should be employed. One alternative is to substitute more complex models and simultaneous equations for simple models and less efficient least square regression or simpler techniques. *Second*, inferences based on particular analysis may often prove erroneous if macro relationships are disregarded. Inference from a sample may be that one farm can increase re-

turns by shifting resources from hay to grain. Yet, should all farmers shift, an opposite outcome is possible. This complex is also important in outlook work where recommendations framed in micro perspective may have an opposite aggregative outcome.

Systematic Specialization

Historically, a large number of specializations have emerged in agricultural economics. These include credit, appraisal, farm management, production economics, tenure, land economics, cooperation, prices, policy, egg marketing, milk marketing and others. These specializations grew up largely around individuals who initiated specific studies. They do not parallel systematic economic problems and analytical tools. Development of these specific strata took place before the full role of economic analysis was recognized. Specializations have been perpetuated over time through graduate training and reverence for fields *per se*. Since historical specializations make little sense in terms of systematic economic problems and analytical tools it is impossible to designate "specific theories" which fit "specific fields." Agricultural economics research will be more productive in the long run if specialization is in terms of systematic economic problems and models. For example, it is impossible to study the economics of land, capital or labor use alone and distinct from the other factors. These can be studies in proper perspective only as part of the more general production economics (resource efficiency, farm management).

Alternative specializations might be possible in terms of systematic economic analysis. The major problems of an economy are, of course, efficiency in production (including progress), equity in income distribution, and stability of the system. More specifically the basic relationships (both micro and macro) are (1) production relationships, (2) consumption relationships, and (3) market or exchange relationships for (a) resources and (b) commodities. In terms of economic analysis (systematic problems and analytical tools) the following appear to be relevant areas of specialization in agricultural economics. Reference is to particular equilibrium and basic analytical tools: (1) *Production economics as a study of resource combination and allocation*, (2) *Consumption economics as a study of household welfare and income allocation*, (3) *Market economics as a study of price, supply, demand, and other market*

relationships, (4) Resource prices as a step in analysis of functional and personal income distribution.

Perhaps additional specializations are needed. Even the fields delineated above on the basis of major economic relationships are too specialized for many problems. One area of importance is that of instability and the forces underlying economic fluctuations. The models appropriate for analysis of major phenomena (national income and employment) lie in the field of aggregative economics. However, certain micro tools are also applicable and fundamental in the study or prediction of the behavior of particular units. These might better be handled in specializations which treat the static phases of production, consumption, and market relationships in order that realism be retained.

Policy is another area which must be mentioned. However, there are no unique relationships or analytical tools (the criteria here for delineating specialization) underlying policy. It simply relates the specific quantities of several particular relationships. All economists should be concerned with "policy." There can be "policy" in terms of individual as well as of national scale. The same mathematical criteria and necessary conditions for *maximization* exist in case of any unit. The point is this, there is nothing unique about economic analysis at any level or scale. Agricultural economists should be *economic analysts* rather than extreme specialists who do not follow out a problem to its roots.

Economics of Primary Production

The most highly developed set of analytical tools in economics is that of microeconomics. Yet a great void exists in their use, even in areas where they are clearly applicable. Two centuries of economists have developed a highly refined and in some respects a time-established theory of production, economics of the firm and marginal productivity analysis. Farm management, an historic and applied counterpart, is variously defined as a study of intra-firm, inter-firm, and inter-regional resource efficiency. Perhaps no other specialization in agricultural economics is so richly tooled in principles and theory. Even then, some workers fail to recognize simple, time-established, and extremely obvious models and relationships. Note the empirical findings from many surveys and record analyses showing that "the higher the crop yield per acre the greater the

profits." These imply constant or increasing returns. Even farmers recognize this fallacy. Otherwise, the entire product for one farm or the nation would be grown on a single acre.

The theory of the firm and marginal productivity analysis define optimums for the combination of resources for a given output, the allocation of given resources between alternative products, the level of intensity for specialized resources, the relationship of returns to scale, the location of production, the timing of production in terms of seasonality and conservation, the form of resource acquisition, and other questions of resource allocation and productivity both within firms (farms), between particular farms, between particular regions, and so forth. They provide the skeleton upon which empirical analysis should be built in terms of sample design, statistical technique, and forms and sources of information.

An important portion of farm management research is in terms of static analysis. Its findings are for given prices and transformation coefficients since studies are made for one year of established price and yields (or a period of years with a given mean of these) with implication that these will continue into the future with certainty. These analyses are unrealistic. The dynamic theory of production, the analytical counterpart of farm management is often of infinitely greater value in explaining or providing the rationale of economic behavior than current static empirical analyses. Study of risk and uncertainty and the dynamics of the firm is one of the most neglected areas in farm management. Straight testing of the hypotheses which now exist in pure theory stands to be of value in itself. Studies should provide basic information not only for guidance of individuals but also as a foundation upon which policy (storage, credit, price) designed for greater stability might be based. Research should indicate the manner and degree to which resources are adapted in terms of cost structure and flexibility and adaptability; selection of enterprise, scale of operations, and capital rationing. Another neglected area of analysis is that of returns to scale in agriculture. Although the greatest proportion of farm management studies over the past three decades have examined the efficiency of farm size, there are no systematic studies which indicate the nature of economics to scale. Investigations built around existing theoretical models would be of value in removing the multitude of public myths, beliefs, and conflicts which now revolve around farm size. Studies are also needed of the interrelationship of the firm and the household in agriculture.

However, the tools of static analysis are by no means obsolete and useless. On the one hand the production economist should take the initiative and cooperate with the technical scientist in establishing the physical transformation coefficients, marginal rates of substitution and production functions such that cost and prices can be applied to suggest the most efficient combination of resources. On the other hand application should be made of the static models of marginal analysis in estimating the (value) productivity of land, labor and capital resources in particular firms, in particular farming regions, for particular products, etc. Productivity analysis of this sort should indicate the degree to which disequilibrium exists in the allocation of farm resources and hence serve as a guide to (1) individuals in adapting their resources within the business, between farming regions and between industries and (2) government policy designed to promote resource efficiency.

It is at this very point that an important distinction should be made between the findings of micro and macro analysis. Aggregative analysis of the last several years suggests that the value productivity of capital is relatively high as compared to labor under the existing structure of agriculture. Hence the interpretation that a greater total quantity of the former and a smaller quantity of the latter should be employed. Yet it is in instances such as this that aggregative analysis may break down. It does not recognize particular relationships which are all-important. A distinct and likely possibility is that should less labor be employed in agriculture, less total capital would be "required." The value productivity of a given total quantity of capital might also be less. The hypothesis is this: A smaller number of people and farms in agriculture would necessitate fewer buildings, fences, tractors and machines. The decreased investment in these specific forms of capital could, of course be invested in other specific forms, such as fertilizer, improved seed, etc. Because of the inelasticity of demand for most farm commodities, however, the value productivity of an equal total capital might well be less in the second than under the original organization of agriculture. Only particular analysis can segregate these potentialities.

Market Relationships

Specialists in price analysis have been generally aware of tools which underly their investigations. They have been concerned in estimating demand curves, supply curves, and price elasticity of

demand for specific commodities. Perhaps not enough attention has been focused on income elasticity of demand. Analysis of specific market relationships will continue to play an important role. Knowledge of composite demand curves, supply curves, and price and income elasticities for agricultural products is basic to policy. However, knowledge of these quantities for specific commodities is equally important. The composite analysis tells nothing about the outcome for individual commodities under a given price policy. If the elasticity of aggregate demand is less than unity, for example, the elasticity for a particular commodity may still be greater than one or even less than for all commodities (as an average). Obviously, particular analysis is important both as a basis in advising individuals (outlook work) and in predicting income and other consequences of price storage and similar programs.

However, particular relationships perhaps can be isolated only if the investigator is aware of the important aggregative relationships. It is now widely recognized that many of the empirical demand curves derived by least squares regression for individual commodities in the past have been only hybrid expressions of different demand and supply curves for the particular commodity and certain composite variables of the economy. Current econometric procedures suggest means whereby the aggregative forces can be treated in a system of simultaneous equations which allows isolation and more efficient estimation of a particular market's relationships and quantities.

Secondary Production or Agricultural Processing

A large portion of the analysis labeled "marketing" is not "marketing" at all in terms of basic economic relationships (supply, demand, price, elasticity). In terms of analytical models the nearest kin of the study which relates costs and volume in creamery operation, resource productivity in the packing plant or the location of soybean processing is farm management or production economics research. All are studies in the economics of the firm or the theory of production. The only distinction is this: One deals with primary while the other deals with secondary production.

A large number of important studies are possible within the area of secondary production and the applicable analytical framework. These parallel the relationships of production studied in farm management and need not be repeated in detail here. Market

relationships need have little bearing on such studies. However, there is an important area in secondary production where the analytical framework is both one of production and one of market relationships. This situation holds true for monopoly, oligopoly, or other forms of imperfect competition. Here demand or supply curves are not only relationships of a particular market but are also those of a particular firm. Although Nicholls pioneered important and original work in this field, the field has not yet been fully exploited.⁶ Extended research is still needed in specific products and for specific firms. Microanalysis in the several areas of specialization should eventually aim at a general equilibrium analysis.

Income Distribution and Consumer Economics

Recent and current agricultural policies have been built largely upon distorted inferences surrounding aggregative quantities. The basic claim upon which agriculture has sought and obtained income transfers (under the guise of various storage, price, conservation, and other policies) has been the "aggregative" comparison of income per farm person with income per non-farm person. These broad averages are meaningless. There are many people on farms with incomes greater than those in other industries. The income of the wealthy farmer is supported, bolstered, and increased in magnitudes entirely out of line with welfare criteria and the public subsidy to the low income farmer or non-farm family. This comes about evidently because the public looks at composite farm and non-farm income ratios and therefore concludes that all farm people are "poor" and all non-farm people are "rich." For this and other reasons, research in income distribution and the pricing of factors is important. Here the crucial analysis should be in terms of particular individuals and groups and of the interrelationships of resource productivity, resource price and resource ownership. Analytical guides are not so clear cut here as in other important problem areas. However, the concepts of markets for factors and the marginal productivity of resources are steps toward formulating systematic analyses of personal income distribution.

A marriage which stands to be productive is that of studies in personal income distribution and consumer economics. The import

⁶ Nicholls, W. N., *Imperfect Competition in Agricultural Processing Industries*, Iowa State College Press.

of this joint relationship ranges from obvious individual problems to far-reaching public policies. The welfare justification of a price policy in agriculture depends partly, for example, on fashioning means whereby the consumption and diet of low income persons can be improved. Similarly, a storage program alone which stabilized production or the flow of product to the market may or may not increase total welfare, depending on how it affects individuals. One possibility is that the increment to total utility is greater under fluctuating supplies whereby low income groups can occasionally buy a quantity of the product than under schemes which stabilize prices and supplies out of reach of their incomes.

Welfare

All economic reorganization aimed at maximum social welfare must be couched ultimately in terms of particular economic units. The reasoning is obvious. Reorganizations are either one of two sorts: (1) those which make some individuals or groups better off only at a sacrifice of utility by other individuals, and (2) those that make some individuals better off without impairing the utility of others. An increase in total welfare is always guaranteed under the second. This is not true, however, in the first. The increment in utility to benefiting individuals may be greater than the decrement in utility to sacrificing persons. Policy could be based entirely on aggregative quantities only were it true that all individuals gain and none sacrifice as a result of public actions. This notion is entirely apart from reality, most economic reorganizations result in transfers between individuals. Occasionally, it is clear that transfers augment total welfare, but in most cases this is not true. Since inter-personal utility comparisons are impossible, an increase in total welfare can then be guaranteed only if compensation can be directed between the two groups so that the position of those with impaired incomes is no "worse off" than previously. Accordingly, policy can guarantee greater welfare only as it recognizes particular relationships and so gauges its course of action. Microeconomics will thus continue to be important and perhaps a crucial area of specialization and concentration.

IMPLICATIONS OF AGGREGATIVE THEORIES FOR AGRICULTURAL ECONOMISTS

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WAVES of fashion are not uncommon in economics. Each generation of economists seems to have its own "Holy Grail." The graduate student of today is exposed to and becomes saturated with concepts and relations unknown to his teachers in their days of graduate study. Nevertheless, there does exist a continuity in the development of economic thought. The historian of economic ideas can usually point to some earlier writer who at least had the "germ" of the so-called new approach. Today, a forefront of economics is immersed in that area which some call aggregative theories and others refer to as macroeconomics.

I

An early point to clarify concerns the essential differences between aggregative and particular equilibrium theories. A main difference is that particular equilibrium theories are concerned with the economic characteristics of individual consuming units, individual producing units or a particular industry. In contrast, aggregative theories deal with the economic system as a whole. Their object of analysis is the functioning of the economic system in totality, and the variables are values or functions of national totals or national averages.

Aggregative theories are a means of approaching, in a simplified but manageable way, some of the goals of the Walrasian general equilibrium. That system, as is well known, incorporates individual households and firms, as well as interrelations within the entire economy. Each separate economic unit is explicitly reflected, and each product has its own supply and demand functions which include also the prices of all other products. Conceptually, such a general equilibrium structure, if specified in adequate detail, can provide a means of determining equilibrium prices and quantities for the system as a whole as well as for the separate economic units within the system. To construct such a system, however, requires an extremely large number of equations to be solved in order to determine an equally large number of unknown values. Why Walrasian general equilibrium analysis has not proven useful

for practical purposes can well be appreciated.¹ To have a method of analysis which is manageable and provides a basis for making usable economic decisions concerning the economy as a whole, it is necessary to deal with aggregates and use aggregative theories. Such methods of economic analysis are often referred to as macroeconomics, in contrast with microeconomics which pertains to the behavior of individual economic units and for which particular equilibrium analysis is widely used.

It is quite clear that the current emphasis on macroeconomics stems from the profound impact of Keynes' *General Theory*.² Many earlier writers did think, analyze and write in terms of aggregates, but the analysis by Keynes of national employment and its determinants set the stage for the current emphasis (more than a fashion, I believe) in analyzing problems of employment, income and wages. Aggregative theories, however, are not limited to Keynesian or neo-Keynesian economics. Anti-Keynesians or "neutrals" have and do operate in an aggregative framework.

The recent and current emphasis on macroeconomics is, in part, a return to the general analytical methods of the classical economists and even their predecessors. The Physiocrats, Mercantilists, Smith, Ricardo, Malthus and their contemporaries were primarily interested in and worked with national economic aggregates.³ In their frame of reference, the individual firm and the individual consumer did not receive the analytical attention afforded them by later writers. Only beginning with the neoclassicists did the analysis of the individual consumer receive priority, and it was even later that

¹ A simplification of the Walrasian general equilibrium system in terms of industry aggregates has been developed theoretically and statistically by Leontief. See: Wassily Leontief, *The Structure of American Economy, 1919-1929* (Cambridge 1941); the following papers in the *Quarterly Journal of Economics*, Vol. 58 (February 1944), Vol. 60 (February 1946), Vol. 61 (November 1946); and "Recent Developments in the Study of Interindustrial Relations," *American Economic Review, Papers and Proceedings*, Vol. 39, May 1949, pp. 211-225.

² John Maynard Keynes, *The General Theory of Employment, Interest and Money*, (Harcourt, Brace and Co., New York, 1936).

³ Joseph A. Schumpeter, in "Keynes, the Economist (2)" (*The New Economics*, edited by Seymour Harris, Knopf, New York, 1947, Chap. IX) writes: "Richard Cantillon was the first, I think, to indicate a full-fledged schema of aggregative, monetary, and income analysis, the one worked out by Francois Quesnay in his *Tableau Economique*. Quesnay, then, is the true predecessor of Keynes."

The progress of aggregative analysis, before Keynes' *General Theory* but in recent years, is indicated in J. Tinbergen, "Annual Survey: Suggestions on Quantitative Business Cycle Theory," *Econometrica*, Vol. 3, No. 3, July 1935, pp. 241-308. On this point, also see; H. S. Ellis, "The State of the New Economics," *American Economic Review*, Vol. 39, No. 2, March 1949, pp. 465-477.

the individual firm became the object of intensive analysis. But beginning with Marshall, partial equilibrium theory became so entrenched that the recent emphasis on macroeconomics seemed to some an innovation rather than a resumption of an established method of analysis.

II

Those who have specialized in farm management or production economics of the individual farm have most clearly confined their interests to what is now termed microeconomics. But even there, interest developed in questions of aggregative behavior. In fact, some of the early notable work by agricultural economists grew out of the recognition by some farm management students that full appreciation of the adjustments faced by the individual farm required more knowledge about industry or group adjustments, and of the behavior of the economic system at large.

The study of supply-response in agricultural production broke away from the confines of the individual farm and became concerned with group adjustments. Interest had shifted from the individual producer to an aggregate of producers of similar products. The preoccupation of agricultural economists with statistical demand curves, beginning in the early 1920's and not yet abated, also may be cited as an example of our concern with national or aggregative economic relations, although limited usually to specific commodities.

The situation and outlook program, which had already been highly developed before World War II, was pitched at the level of particular agricultural industries. Although the Marshallian partial equilibrium apparently was the theoretical structure underlying the studies for the various farm products, some aggregative features were recognized since the outlook was framed with reference to the particular industry at large. But here an element of macroeconomics also appeared. A major factor affecting outlook was the level of national income which influenced the outlook for all industries. But national income or the general price level pertained to the economy as a whole. Thus, the situation and outlook analyses incorporated some macroeconomic variables within a particular equilibrium framework.

The preceding examples have been briefly cited only to recognize that agricultural economists have been aware of and have used

aggregates. But they have been primarily aggregates for particular industries, and thus the economic analysis used retained largely the features of particular equilibrium. The situation and outlook program, for instance, treated macrovariables as exogenous. Questions of economic relations between agricultural industries or between agriculture and the nonagricultural segment of the economy, or between macroeconomic variables for the economy at large, were not dealt with explicitly.

In the middle and the late 1920's, agricultural economists began to pay considerable attention to national agricultural policy. However, the theoretical treatment of policy questions was based largely on a microeconomic analysis. For example, the economic analyses of "two-price" plans, such as McNary-Haugen and Export-Debenture, incorporated the theory of price discrimination. The theory of price discrimination, however, is not in the real sense an aggregative theory; it grew out of and is logically still limited to the pure-monopoly individual firm. Only by imposing extra-economic (e.g., legal or administrative) constraints upon individual firms to give the group a semblance of an economic entity can price-discrimination theory be used as a rational explanation of multiple-price plans applied to agricultural industries composed of a large number of separate firms. A similar conclusion may be reached with respect to marketing agreements, the economic rationale of which is basically price-discrimination theory.

The use of microeconomics in analysis of multiple-price plans and marketing agreements assumes that the commodity or industry under consideration can be isolated, in terms of impact and interaction, from other commodities, industries or the rest of the economy. The validity of such an assumption is questionable, especially for major commodities. Even if the assumption is not too unrealistic for individual minor commodities, such programs for a substantial number of minor crops, operating at the same time, may have an aggregative effect different from that expected on the basis of a single crop program. One may wonder whether the instability of multiple-price programs or the meager success in evaluating their effects stems at least partly from the fact that they are based on a theoretical framework of microeconomic analysis rather than some type of aggregative theory which reflects relations of the particular industry to other industries and the economic system as a whole.

The development of the AAA parity-price and parity-income

program brought with it an emphasis on national aggregates. The agricultural sector of the economy, aggregated by some means into a single economic entity, was contrasted with the nonagricultural sector, which was also aggregated by some heroic procedure. The interrelation and interaction between the two sectors or aggregates and the impact on the total economy was presumably explainable in terms of some aggregative theory which, although implied, was not clearly formulated.⁴ One may wonder what specific economic theories underlie parity-price or parity-income programs. But one cannot deny that some type of an aggregative theory is appropriate; a theory which would include aggregate variables for the agricultural and nonagricultural sectors, and whose purpose would be to bring out clearly the effects of parity programs on income and employment in the nation as a whole as well as in the agricultural and nonagricultural spheres. It should be noted, of course, that serious problems exist in connection with the process of aggregation.

It is widely accepted that for an industry which is purely competitive in the purchase of productive services and the sale of product, the industry's short-run supply function is equivalent to the simple horizontal summation of the short-run marginal cost functions of all of the firms comprising the industry. This is a simple example of the process of aggregation. But that is not an aggregative theory; rather, it is only an aggregative process which yields one type of function from other functions. In order to have theoretical relations between aggregate variables similar to the relations which exist between the microeconomic variables, the aggregates must be constructed in an appropriate manner. Simple totals, averages or usual types of index numbers need not yield aggregates whose interrelations can validly be used as in a microeconomic theory. For example, on a given farm using a specified production function, the equilibrium utilization of the productive services is based on the proposition that the marginal value product of each service equals the marginal cost of the service. To make an analogous statement for a group of farms, the aggregate variables reflecting the group must be constructed and measured appropriately.

⁴ See Mordecai Ezekiel, and Louis H. Bean, "Economic Bases for the Agricultural Adjustment Act," U.S. Dept. of Agriculture (Washington, D.C., December 1933) for a widely distributed official statement; but in that publication the particular aggregative theory on which the argument is based is not sharply drawn.

Let us now return to the question of what bearing the aggregation process has on our use of economic theory. The conventional static marginal productivity theory of distribution may be considered as another example. Although such a theory may be questioned as to its realism in depicting individual firm behavior, its logical validity—as an internally consistent set of relations within the static framework—still stands. But what can we say about applying the marginal productivity theory to an industry or to the economy at large? Is the theory which is logically valid for the individual firm also valid for a sector of the economy without affecting some of the pertinent relations incorporated in the theory?

The outcome of several papers on this question indicates that the usual marginal productivity theory based on the individual firm cannot simply and at the same time validly be carried over in application to aggregates, and such procedure is even more invalid if the productive services are not homogeneous.⁵ Unless the analogies from microeconomics do occur among the aggregates, it would appear that basing our study of resource allocation in production or marketing, for agriculture as a whole, on marginal productivity analysis of aggregates (or simple averages) is of questionable validity.

The current emphasis on marketing research is spread over a wide range of marketing activities. In some quarters, interest is centered on the apparent temporal rigidity in marketing margins, their magnitude, and their relations to prices. These are questions the study of which cannot be successfully carried forward only by hypotheses drawn from the economic theory or behavior of the individual firm, since marketing margins also reflect group behavior

⁵ Some of the major references on this question are: F. W. Dresch, "Index Numbers and the General Economic Equilibrium," *Bulletin of the American Mathematical Society*, Vol. 44, February 1938, pp. 134-141; M. W. Reder, "An Alternative Interpretation of the Cobb-Douglas Function," *Econometrica*, July-October 1943; M. Bronfenbrenner, "Production Functions, Cobb-Douglas, Interfirm, Intrafirm," *Econometrica*, January 1944; J. Marschak and W. Andrews, "Random Simultaneous Equations and the Theory of Production," *Econometrica*, July-October 1944; L. R. Klein, "Macroeconomics and the Theory of Rational Behavior," *Econometrica*, April 1946; *idem*, "Remarks on the Theory of Aggregation," *Econometrica*, October 1946; Kenneth May, "The Aggregation Problem for a One-Industry Model," *Econometrica*, October 1946; Shou Shan Pu, "A Note on Macroeconomics," *Econometrica*, October 1946; Kenneth May, "Technological Change and Aggregation," *Econometrica*, January 1947; W. W. Leontief, "Introduction to a Theory of the Internal Structure of Functional Relationships," *Econometrica*, October 1947; David Hawkins, "Some Conditions of Macroeconomic Stability," *Econometrica*, October, 1948.

which affects the individual firms.⁶ Aggregative analyses are also called for, and dynamic rather than static theories are necessary.

III

Let us now turn to some general implications of aggregative theories for agricultural economists. Current discussions of employment and cycle theory are saturated with macroeconomic concepts such as savings, investment, multipliers and propensities. Regardless of what attitude one may take towards Keynes' formulation in his *General Theory* or the revisions and modifications by neo-Keynesians, it appears that aggregative analysis, which preceded Keynes, will also remain with the economic profession for some time to come after Keynes. This is likely not only because macroeconomic concepts and theories have a strong affinity to national policy problems, but also because microeconomics (e.g., Marshallian particular equilibrium) or Walrasian general equilibrium have not succeeded in providing concepts, tools, and theories which adequately deal in a usable manner with the type of problems handled by a simplified macroeconomic theory.

It would seem to me that it is important for agricultural economists to be at least familiar with methods of analysis and types of theory which in practice have and are very likely to continue to have an impact on national economic policy. Lack of sympathy with results of certain macroeconomic analyses, or disapproval of policy interpretations of certain macroeconomic theories, does not justify one's neglect of such theories. Contemporary developments in general economic thought are of significance to us as economists. We possibly could profit by seeking out from general macroeconomic studies those tools and elements that would be helpful in our own work.

It may be worth while to consider the development of aggregative

⁶ In this connection, the following statement is pertinent: "However, my main purpose is to identify a source of frustration in present marketing work. Most marketing research is concerned with efficiency. The frustration is the result of a problem in unit and interunit relationships in the field of distribution. Stated dogmatically, whatever inefficiency exists in marketing is rarely found in correctible form in the individual unit. The research worker thus comes, as he must, to the inefficiency of the complex of units that compose the market." This statement is from J. K. Galbraith, "Appraisal of Marketing Research," *American Economic Review, Papers and Proceedings*, Vol. 39, No. 3, May 1949, pp. 415-416. If "the inefficiency of the complex of units that compose the market" cannot be corrected at the individual unit level, an alternative is the evaluation of correctives applied to the aggregate; such evaluation would involve aggregative theories.

theories applicable to agriculture and which fit into macroeconomic theories concerning the economy at large. With the use of aggregates, and in terms of macroeconomics, Keynes claimed to have developed a logical explanation of the existence of macroequilibrium at less than full employment. This is a result at variance with neoclassical doctrine, but a result which had a marked stimulus on current thought. Hence, if there exists chronic unemployment in the agricultural sector of our economy, might it not be explained by some aggregative theory applicable to agriculture and which is consistent with a national macroeconomic theory? Usually, explanations of the existence of unemployment in agriculture are presented in terms of rigidities, frictions, and institutional influences, which undoubtedly are relevant, but they certainly do not comprise a theory.

The advantages of working with an appropriately constructed aggregative or macroeconomic framework should not be slighted. One advantage we have already touched upon. Relations or attributes of individual firms or consumers, or even of small groups of firms or consumers, need not be valid for the economy or large groups. The possibility of interaction within the group may give it a character different from that of each of its many components. Also, at the same time, we can often say more about the characteristics and behavior of an aggregate and predict more reliably its behavior than we can for the individual firms or consumers composing the group. The behavior of the aggregate is more stable than the behavior of the separate individuals. Hence, we have a better basis for the study of empirical relations and derivation of statistical uniformities. With respect to agricultural production-adjustments, marketing, and consumption, there may be group-behavior characteristics waiting to be discovered, the knowledge of which would contribute to our understanding of the agricultural economy and its interrelations with the nonagricultural sectors.

Some introductory work along this line has been done in sketches of behavior characteristics of the aggregate agricultural sector contrasted with the nonagricultural sector of the economy.⁷ Such

⁷ Theodore W. Schultz, "How Efficient is American Agriculture?" this *Journal*, Vol. 29, No. 3, August 1947, pp. 644-658, *idem* "The Economic Stability of American Agriculture," this *Journal*, Vol. 29, No. 4, Pt. 1, November 1947, pp. 809-826; Walter W. Wilcox, "The Efficiency and Stability of American Agriculture," this *Journal*, Vol. 30, No. 3, August 1948, pp. 411-421. Also, see: Trygve Haavelmo, "Quantitative Research in Agricultural Economics: The Interdependence between Agriculture and the National Economy," this *Journal*, Vol. 29, No. 4, Pt. 1, November 1947, pp. 910-924.

sketches, and inferences drawn from them, may be viewed as elements in a macroeconomic model which explicitly includes as variables functional relations within as well as between the agricultural and nonagricultural sectors. In this type of analysis, we approach macroeconomic theories which may adequately account for, in a useful way, the working of the national economy and agriculture's position in it.

The use of aggregative concepts has been criticized on the grounds that such procedure neglects the more important economic entities such as the individual consumer or individual firms. Some economists, for example, have attacked the Keynesian system for not explicitly recognizing the influence of the distribution of income. The criticism, I believe, is valid. But although the Keynesian structure does not directly incorporate income distribution as a variable, it does not follow that all macroeconomic theories need to exhibit a similar neglect. As macrotheories develop and as more variables are included, significant elements such as income distribution can be introduced. It may be noted, however, that burdening macroeconomic theories with too many variables will dissipate a major advantage of macroeconomics, mainly simplicity and manageability.

The simplicity of macroeconomic theories has been the subject of frequent criticism; it has been asserted that the models are so simple that they lose all semblance to reality. But such simplicity, if it is fully recognized, may well aid rather than handicap the analysis of economic relationships. Here, as in microeconomics, the danger lies not in the simplicity itself, but in the mistaken identification of the simple model with the complicated structure in which we are basically interested. The over-simple characteristics of a macroeconomic model are relatively easy to recognize and to bear in mind; whereas in the usual microeconomic analysis of the individual firm, for example, there has been a strong tendency to substitute the elementary model and its assumptions for the complexities of economic reality. A case in point is the marginal cost-marginal revenue explanation of short-run price and output determination by the individual firm.⁸

⁸ Of the substantial number of papers participating in the marginal-pricing controversy, the following may be cited. R. L. Hall and C. J. Hitch, "Price Theory and Business Behavior," *Oxford Economic Papers*, No. 2 (1939). R. A. Lester, "Shortcomings of Marginal Analyses for Wage-Employment Problems," *American Economic Review*, Vol. 36 (March 1946), *idem* "Marginalism, Minimum Wages, and Labor Markets," *American Economic Review*, Vol. 37 (March 1947); "Equilibrium of

An essential question is whether we can deduce useful generalizations from aggregative theories which cannot be learned from microeconomics. The answer appears definitely to be in the affirmative. This has long been recognized in business cycle theory. Regardless of the detail to which the theory of the individual firm or household is carried, whether it be a dynamic or static theory, it cannot explain, in a manner useful for making practical decisions, the levels and movement of employment, income, savings, investment for the economy as a whole nor variables such as "the" rate of interest. To study such important problems, and in our society they are of prime significance, our practical recourse is to the use of aggregates and analyses in terms of macroeconomics.

In connection with agricultural policy, the importance of national income and employment levels to agricultural prosperity is now widely recognized. The notion that national income can be advanced, in a permanent way, by special farm programs, no longer has the acceptance it received a few years ago. Now, most students lean toward the idea that, "High-level employment in non-agricultural industry means very much more to farmers than any 'farm-program' the government may attempt."⁹ This view leads us to the thought that macroeconomics is the appropriate framework in which to deal with some important aspects of the so-called "farm problem."

The "farm problem" might well in large part, though not entirely, disappear in the face of an over-all national economic policy which provides a relatively stable and high level of aggregate employment and income. Some farm programs involve the flow of government funds directly to particular agricultural producers or industries. But such programs are difficult to justify, from the national viewpoint, unless it can be demonstrated that injections of purchasing

the Firm," *American Economic Review*, Vol. 39 (March 1949). Fritz Machlup, "Marginal Analysis and Empirical Research," *American Economic Review*, Vol. 36 (September 1946); "Rejoinder to an Antimarginalist," *American Economic Review*, Vol. 37 (March 1947). G. J. Stigler, "Professor Lester and the Marginalists," *American Economic Review*, Vol. 37 (March 1947). H. M. Oliver, Jr., "Marginal Theory and Business Behavior," *American Economic Review*, Vol. 37 (June 1947). R. A. Gordon, "Short-Period Price Determination in Theory and Practice," *American Economic Review*, Vol. 38 (June 1948). Wilford J. Eiteman, "Price Determination, Business Practice Versus Economic Theory," Bureau of Business Research, Report No. 16 (January 1949), School of Business Administration, University of Michigan.

⁹ "Postwar Agricultural Policy," Report of the Committee on Postwar Agricultural Policy of the Association of Land-Grant Colleges and Universities (October 1944), p. 8.

power into agriculture have a greater multiplier effect and a more desirable distribution effect on aggregate income, than money injections into other groups in our economy.¹⁰ To my knowledge, such a demonstration has not been provided.

Since the macroeconomic theories proposed in recent years were developed to deal with the level of aggregates as employment, income, or investment, such theories throw little light upon the question of resource allocation. But that is a question which has attracted the attention of agricultural economists, especially in connection with the formulation and appraisal of agricultural programs. The distribution of employment between agricultural and nonagricultural pursuits, for instance, or relative wage rates in the two spheres, or relative prices of farm and other products, or relative costs and returns in the agricultural and nonagricultural sectors are relations pertinent to agricultural policy. Such questions and others related to the problem of resource allocation receive little aid from presently available macroeconomic theories. It would therefore appear that there is need for macroeconomic theories for analyzing questions of resource allocation. Such macroeconomic theories might prove more enlightening than a marginal productivity framework now usually used in the analysis of resource allocation.

IV

The preceding comments are not meant to imply that microeconomic analysis is obsolete and can serve no useful purpose in agricultural economics research or program-policy formation. On the contrary, it seems to me that as macroeconomics matures, and as we advance from a skeleton of macroanalysis to full-bodied macrotheories, it becomes equally pertinent that our tools of microanalysis and particular equilibrium be improved.

Economic problems in agriculture are so vast, complicated and varied in character that no one single approach will induce a complete understanding. For certain problems and questions, the knowledge of microbehavior is necessary, and in the study of such problems microeconomics remains the appropriate approach. Macroeconomics and microeconomics are not competitive approaches to

¹⁰ A somewhat similar point is made in Report of a Committee, "On the Redefinition of Parity Price and Parity Income," *This Journal*, Vol 29 (No. 4, Part II) November 1947, pp 1353-77.

the analysis of economic phenomena; rather, they are complementary and consistent with each other. Microeconomics and macroeconomics supplement each other in a manner as firm analyses and industry analysis or as the short run and long run are complementary.

But many significant economic problems are not wholly within a macroframework nor wholly within a microframework. Many problems lie largely within a penumbra which is bordered by both the micro and macrotechniques. Hence, a bridge is required so that we can easily transfer from one approach to the other. To accomplish such an objective, a really general theory, of which both macroeconomics and microeconomics are special cases, is required. But it should be sufficiently simple and so constructed that usable decision-making hypotheses can be stated and accepted or rejected by empirical tests. Such a general theory would not only bridge the present gap between micro and macroeconomics, but might also suggest paths of action from national policy to programs in particular industries and adjustments by particular firms.

USE OF ECONOMICS IN FARMING

TRUE D. MORSE

Doane Agricultural Service, Inc.

THIS is a joint meeting of Farm Economists and Farm Managers to discuss "Farm Management as an Art." The title implies a degree of management ability applied to farming that is above the ordinary—ability that goes beyond the mere application of rules and standard methods. Certainly, farm management cannot be lifted to the level of an art without unlimited use of economics.

This fact stands out with increasing vividness as farming becomes more commercialized and as the government takes an increasing part in managing farms and agriculture.

Production methods and techniques are successfully applied to individual farms by increasing numbers of farmers and farm managers. The response of the different soils to various treatments can be determined from published experimental data and verified by use on the farm. Methods of plowing, planting and cultivating are well known, and with modern machinery, can be repeated with an increasing degree of precision. Seed of known quality can be purchased. Chicks and poults are purchased according to standard specifications, brooded under precision machines and grown with feed of known quality. Livestock breeding and feeding is done with more and more knowledge that certain practices produce specific results—the range of variability is being constantly narrowed.

This increasing control of production has been greatly moved forward by the commercialization of agriculture. Many of the most difficult jobs are now done by specialists working for large companies that standardize their products. The production of hybrid seed corn, chicks and poults are examples. The mixing of feeds, fertilizers and pest control materials are commercial operations. Commercialization has certainly made a major contribution in stepping up production control on farms by providing efficient machines and equipment.

Dr. O. R. Johnson, head of the Economics Department of the Missouri College of Agriculture, in addressing Farm Managers last fall, told them—"...land itself resembles more and more an empty factory building like Willow Run before Kaiser-Frazer moved in. What the farm operator does in the space provided is

becoming much more significant than any inherent qualities which that space may possess."

The production side of farming deals largely with tangibles. In contrast to this, the economics end of the business deals with intangibles that cannot be nailed down into definite formulas or carried through with precision machines and equipment. Economic forces controlling prices may be cut across any day or any hour by local, national or world events. All calculations of a farm manager may be changed by a new law or an administrative decision of a governmental official or board. As compared with the production part of his job, farmers and farm managers continue to swim in a sea of economic uncertainty.

This does not mean that progress in the field of economics has been less than in production. These facts are set forth to show the great need of farmers and farm managers for economics. This need extends far beyond their own abilities and the resources available to them on the farms or through their organizations.

It is in recognition of this fact that state universities and the U.S. Department of Agriculture have developed agricultural economics departments. Farm organizations have their economists. Financial and commercial firms supplying farmers with services and supplies are more and more attempting to provide economic guidance to farmers and farm managers. They need all the help they can get—much more specific and timely advice than they are now receiving.

Note in that last sentence, I used two words of importance—"specific" and "timely." This entire paper could well be used to discuss either. Too many economists are either so uncertain of their judgment and information or so unwilling to risk their professional standing that they fail to be sufficiently specific to be of great help to farmers and farm managers.

Farm operations must be projected long months ahead. Too much economic information is both "too little and too late." Farmers are making their decisions now on buying feeder cattle and lambs to be sold in 1950. Last April and May, they were breeding the sows to get pigs to sell in 1950. The outlook conferences and publications for 1950 will be issued after many of these decisions have been made. This fall, farmers, ranchmen and dairy farmers will be saving back or buying cows and heifers for beef or milk, based on returns they expect to get during the next three years or

more. How much specific advice do they have now to help them make these vital decisions?

With these broad statements as a background, let's look briefly at some of the economic developments that indicate how farmers and farm managers will be using economics in farming.

Industrial production and business trends outside the field of agriculture are known by every competent farm manager to be of vital importance to his success. Demand for various farm products goes far in determining whether prices of the products he is producing will be profitable or not. Farm managers and the most alert farmers are therefore hungry for those expressions of judgments regarding longer time industrial and employment trends that some economists are now issuing. Right or wrong, they want to know what the most competent economists see ahead. The individual farmer and farm manager has little basis for forming a judgment of his own.

Too much that is being said for the press or on the radio is unfortunately tinged with propaganda. For example, some high officials treat citizens like children, "for fear of talking the country into a depression," and put out half-truths and only part of the facts. Farmers and small businessmen go forward half blind to the true situation. That can lead to disastrous management mistakes.

The population is rapidly growing. We are 10 years ahead of schedule on population growth and we are adding over one million people per year. Farm managers are watching not only the total population numbers, but the relative proportions of youth and old people in trying to gear their production to the diets of the people.

The productive capacity of our farmers has moved ahead at a rapid rate. With normal weather, they can feed all the people, regardless of the rapid population growth. Production is running over 30 percent above pre-war, and it will continue at a high level. A new all-time high in crop production was set last year. This will be another record or near-record crop production year.

You know the effect of mechanization, improved seeds and more efficient feeding. Now the use of chemicals holds the possibility of greatly expanding farm production. The growing use of fertilizers is also a major factor. Farmers have been given a liberal education in the use of fertilizers as they have profitably used them during and following the war period.

Alert farm managers know they are in an efficiency race. They

must drive down costs and increase quality. Only the most capable farmers will survive with a decent standard of living.

It now takes cash to farm. Self sufficient farming is gone from commercial farms. For almost every operation cash costs are involved. Will farmers continue to produce when prices drop? Or will they let tractors stay in the shed and land lay idle? Will we shut down farms like factories shut down when the selling price of crops goes below costs?

Farmers never have closed down—will they in the future? I expect to see that happen—idle land and idle equipment.

The impact of the foregoing facts will be most acute in cash crop production areas like the wheat lands of the Great Plains. When either drouth or price prospects indicate that cash production costs will not be returned, farmers and farm managers will shut down their farming or cut production until more favorable conditions return.

The break-even point in farming is higher, much higher than before the war. Even the drops in prices that have already taken place will put many farmers in the red.

Dr. Sherman E. Johnson, when Head of Farm Management in B.A.E. in Washington, was concerned over this development. 1948, "... was the first year in a decade that gross income failed to rise more than costs. Consequently, farmers can't reduce their cash outlays during a price squeeze in the same way that they did formerly. Today, fuel and oil and repairs for the farm tractor are out-of-pocket expenses. A larger share of family living costs also are cash expenses. Most farms now have electricity, and fuel for the farm furnace is delivered by the oil man or the coal dealer rather than being cut from the farm woodlot. Farm real estate taxes . . . have been rising for four consecutive years.

"... the young man who is getting started in farming will have to invest two or three times as much for land, equipment, livestock and supplies as before the war . . . heavy debt on such an investment could be an unbearable burden."

In the present declining phase of the economy, every alert farmer and farm manager should be refiguring his individual farm enterprises as well as his total farm business to establish in advance the probable break-even points. All the specific help that economists can give regarding future prices and costs will be useful farm management tools.

Flexible farming is being advocated. Iowa State College says, "The puzzle of uncertain prices is still with us. . . . Today, more than ever, it is smart farming to keep your business flexible—flexibility and short-term production methods can be combined even in construction of farm buildings."

We are saying to farmers—Keep your operations pliable. Avoid being caught in a profit squeeze due to a rigid pattern of operation that cannot be varied sufficiently to meet shifting conditions. Changes in crop production and carry-over; increases or decreases in the number of hogs, poultry, cattle and sheep; shifts in consumer demand and exports; AND changing government laws, rules and regulations are just some of the reasons why there should be flexibility in your farm program.

Have a basic plan of operation adapted to your farm, ranch or plantation. But, be sure flexibility is provided for in the plan. One very important reason for flexible farming is that governmental regulations lag behind the need for action six months or more. There will be these periods of serious maladjustment in prices and regulations regardless of the political party in power.

Increasing specialization in farming enables farmers and farm managers to become more keen students of economics for the products which they produce. As a result, they will cut back and expand production much more freely than in the past.

As I have already pointed out—the old days of production, regardless of price, may be over for some commercial farmers. Cash costs of farming—with the use of economic facts and forecasts—may cause specialized farms to expand or contract production like industrialists have always done in factory operations.

Price and production controls by the government, of course, will become increasingly dominant. In many cases in the future, price "floors" will become top prices. Floors will become ceilings. Too many small producers will find themselves subject to discounts or prices below those set by the government, as enforcement breaks down or price regulations are avoided.

Profits or losses in the years ahead will be strongly controlled by forces operating beyond the control of farmers and outside the boundaries of the farm. Washington legislators and officials will continue to conceive "Bold New Programs" and move closer to a welfare state. Farmers and farm managers must go beyond economics and try to out-guess political strategy and maneuvers. Re-

ardless of the political party in control, there will continue to be a high degree of uncertainty about what the government will do, and when.

For example, who would have expected turkey growers to be bailed out with good profits with a 31-cent price support after they disregarded all government forecasts and warnings showing the over-expansion in turkeys that was taking place this year?

An example of price discounts was seen in the excessive cuts made in the price of wheat for moisture and such impurities as garlic.

For several years, alert farm managers have been jockeying for a favorable acreage allotment when controls return to high profit crops. They have, of course, been kept almost completely in the dark about what would probably be the basis of allotments.

Rules of thumb are sorely needed by farmers to guide them in management decisions. They should be brief and to the point. Farmers use a lot of them now, but they need to be brought up-to-date and extended by economists, who are in a better position to make them than anyone else.

The old 10 to 1 for corn and hog prices is still in use. Few farmers know, in such simple terms, what efficient producers can expect.

Dr. Stanley Warren of Cornell University has a rough guide, which he gives his appraisal classes, of \$400 to cover the farm investment per dairy cow.

There is evidence in some ranch areas that the real estate investment must be held to about \$150 per cow for practical operations.

We say that animals can afford buildings that cost about as much as the annual gross income per producing female. There are variations such as \$250 buildings for \$200 annual income dairy cows.

How much price increase must you get before you can afford to store wheat, corn, oats, soybeans or cotton?

Such economic guides, quick and easy to use, even though often crude, are invaluable tools that more farmers need to be using in the management of their business.

Farm management must be lifted to the level of an "Art" by those farmers and professional managers who will be successful in the difficult days ahead. Only those who use dependable economic guidance can be assured of profits.

Most farmers and farm managers have neither the background nor the time to master and keep up with the economic information which they need. They must increasingly look to economists who regularly get farm dirt and manure on their shoes to understand the management needs of farmers, and who get the economic advice to them in simple, easy-to-understand terms. The advice must be in their hands when needed, and be specific.

With such aid from economists, able managers of farms will then decide what action to take. Able managers know that economists cannot always be right when they draw conclusions regarding the future—but they want their best judgments. Otherwise, they are blindly managing insofar as much of the economics applying to their farms are concerned.

THE MISSOURI PLAN (BALANCED FARMING)

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THE Missouri Extension Service taught individual farm practices, as did all state colleges, until 15 years ago when the need became apparent for a system of farming that would tie together all of the good practices recommended by the college for a farm in a way to give the greatest net income consistent with continuing improvement of the soil. Throughout the years certain farmers have specialized in beef cattle production and perhaps failed to improve their pastures, and others specializing in crop production failed to receive high net income because of poor feeding practices. The college, with its traditional 12 to 14 departments and Extension specialists for each, undertook to save the farmer by teaching the individual practices, leaving it to the county agent or the farmer to tie these practices together, if any attempt along that line was made.

This idea of developing a system of farming, called in many states Farm and Home Planning, is called Balanced Farming in Missouri. The objective has been to achieve a balance between input and outgo of soil fertility; between type of soil and crops; between pasture and crops and the livestock system; between the livestock system and the desires and abilities of the operator and his labor supply; between net income and the needs of the farm family; between good planning, hard work and a comfortable, attractive home.

The Balanced Farming program has been handled largely by a committee of specialists and supervisors, with a soils specialist as chairman. The program does not belong to the farm management or any other department. Each specialist has an opportunity to push his line of work to the limit but does so in cooperation with other specialists in developing systems of farming. The dairy specialist has come to recognize that the dairy farmer will not succeed unless the soil is improved to enable an abundance of good feed to be grown for low cost production. Crops and soils specialists recognize that improving the soil and growing an abundance of feed is of no avail unless there is good livestock management to get the most dollars out of the increased feed production.

Back in 1936, 22 specialists and supervisors spent four days in

teams of four men, each planning farms and arguing over the plans. Since practically every specialist had been a successful county agent, it was not long until the poultry specialist knew how to lay out a good water management system; not that he expected to do that, but in order that when he talked to county agents and farmers about new poultry practices his recommendations would fit into an over-all plan that took care of erosion as well as raising healthy pullets. The swine specialist quickly recognized that preaching hog sanitation is a futile gesture unless there is a system developed on the farm whereby there will be at least three fields as a minor rotation of corn, small grain, and clover. This provides good pasture and clean ground. Each field must be fenced hog tight and provision must be made at the outset for water in each. Whereas our service preached hog sanitation for years prior to Balanced Farming, our results were very scanty; but now with Balanced Farming we help the farmer plan for hog sanitation so that it is the easy and natural thing for him to do with his hogs.

Naturally, in the early days of Balanced Farming, we started by means of demonstrations, schools, and all the traditional Extension methods. One concept has been held to throughout the years. It must be the farmer's own plan. Even though it takes much longer for the county agent or associate agent to stay with that farm family until they think through what they want to do and why, than it would for the agent to plan the farm, it's the only way to do it if we expect the farmer to do anything about the plan that is made. Changing economic conditions mean that plans must be changed. Therefore if the farmer does not help make his plan he does not know how to change it when he should. He will simply lay up his paper plan on the mantle by the clock and let it gather dust.

I do not think it necessary to go into detail with this group as to how a county agent and the farmer work out the plan. It must be remembered that in our state we have freezing and thawing throughout the winter, with torrential rains through the spring and fall, and are subject to drought in late summer. In addition, most of our state is quite rolling, all of which means we have a terrific erosion problem. No farm plan is complete without a water management system that will provide terraces for at least all fields that are to be used for row crops. We have four Extension agricultural engineers whose job it is to see to it that all county agents, associates, and assistants, have the latest information and

skills on water management with which to assist their farmers. This means of course that it is more difficult in our state to develop farm plans than it is in the states north, east, and west of us which do not have this tremendous erosion problem. What I mean to say is that if Missouri can develop farm and home plans, as it has, there is no reason why other states, with the possible exception of our neighbors to the South, could not do so more easily. While water management is fundamental, our agents start a farmer wherever his interest is greatest. If he is a dairyman, they get him started in the cow test association, in the artificial insemination set-up, with a real dairy feeding, breeding, and selection plan, then lead him on to the needs for better pastures and more feed, showing how soil fertility must be improved to get the extra feed, and how foolish it would be to lime and fertilize soil and then let it wash off.

I trust I have made it clear that Balanced Farming is much more than a soil conservation plan. Balanced Farming gets soil conservation but it gets the highest net income possible first and gets soil conservation as a by-product. There is not necessarily any direct connection between a plan that will give soil conservation and one that will give high income. A farm could be seeded down to timothy and it would save the soil, but the family would starve to death. On the other hand, you cannot have a successful long time Balanced Farming plan, unless the soil productivity balance is increasing. We have simple formulas in our workbook so that each farmer can test this for himself.

To be specific, Waldo Woolf of Warren County, Missouri, had a thin 160 acres that would produce feed enough to carry 10 dairy cows. With his county agent he developed his Balanced Farm plan and by the use of lime and fertilizer, clover, better pasture systems, and a water management plan, six years later the same farm fed 22 dairy cows much better. At the outset of the plan the 10 cows produced slightly over 200 pounds of butterfat per cow. Careful planning and selection of the best heifers, culling out of the poor producers along with a real feeding program, meant that at the end of the six year period the 22 cows had moved from slightly over 200 pounds of butterfat per cow to 419 pounds. That, in a word, is Balanced Farming—moving from 10 cows producing 200 pounds of butterfat per cow to 22 cows producing 419 pounds of butterfat per cow. I need not tell you that quadrupling the gross income means much more than that in terms of net income.

Then there was the Robert Jennings family of Lawrence County, whose 120 acres in 1943 supported 14 mature cows when they started their Balanced Farming plan. By 1947 this farm carried 21 mature cows with 12 heifers. They went from 50,800 pounds of milk in 1943 to 109,000 pounds in 1947. By soil and crop improvement they raised the carrying capacity of the farm 50 percent but at the same time by good herd management they raised the milk per cow from 4200 pounds to 7200. In 1943 they used 2500 pounds of fertilizer, in 1947 they used 9400 pounds; in 1943 they used 12 tons of lime, and in 1947 they used 43 tons. In 1943 they had no terraces, by 1947 they had practically two miles of terraces built or in the process of being built, with three quarters of a mile of terrace outlets ready to receive water from additional terraces. Using 1947 prices, their gross farm income in 1943 would have been \$3386 and by 1947 this was increased to \$7380. Their net farm income rose from \$2390 to \$4632.

Bob Maledy of Dent County, one of our Ozark counties, with his Balanced Farming plan through better pastures and better herd management increased the weight at weaning time, on beef calves, 90 pounds per head. His neighbor, Henry Meyer, with 21 beef cows produced 21 calves which at an average age of 262 days had an average weight of 604.2 pounds. When 8½ month old calves weigh better than 600 pounds on the average, you are getting beef produced and that is what Balanced Farming will do. Back in the late '30's before war prices, Charlie Schaefer of Lafayette County, with his Balanced Farming plan moved in 5 years from a 15 cow beef herd to a 40 cow beef herd and his net income from \$1150 to \$2266.

Tom Ream of Pettis County, with his Balanced Farming plan, was able to save one more pig per litter with his pigs on clean ground and to market them weighing 225 lbs. each a month sooner than he had prior to using the plan. His neighbor with a secondary rotation of three 10 acre fields, one with clean clover pasture for his hogs, was able to make each 100 pounds gain with four bushels of corn and 15 pounds of tankage, in addition to the clover. That means net profit in anybody's language. The alternate poultry yard and farm garden has meant much to our farmers. The ½-acre field that was the poultry run last year is the garden this year. Last year's garden is clean ground for this year's pullets.

We have made lots of mistakes in the development of our pro-

gram and one of them was to assume that it would be better to start the agricultural part of Balanced Farming first and bring in the home side later. We are now making every attempt to rectify that mistake. The object of Balanced Farm planning is better farm family living. Therefore, we start today figuring what the family needs in the way of income to buy the things they need. If the old plan doesn't produce this necessary income then a different plan obviously must be worked out. Small farms naturally must go into intensive systems of farming. If the operator doesn't like intensive systems then it is now clear to him that if he is to have a decent living, he must have more land or change to intensive farming.

I spent last Thursday in Osage County, Missouri, where 10,000 farm people gathered at a Balanced Farming Action Day in what is known as Deer Creek Valley, where five adjacent farms have complete Balanced Farming plans in operation. It was a wonderful sight to see the farm homes with all the labor saving devices that had been developed since they started Balanced Farming. Of the 300 farm families now doing Balanced Farming in this little border Ozark county, over one-third have built new homes or remodeled the old ones. Their plan provides the family a high plane of living, electricity, water under pressure in the home, a kitchen sink, bathroom, and plans for health and educational needs. I mention this since we recognize now that farmers must necessarily move slowly as funds will permit in making the home improvements. It is therefore absolutely essential that a plan be developed as to when these things will be done. Otherwise, less important things will take the funds, the farm woman will become prematurely old, and the youngsters lose their interest in the farm. I wish again to point out that, important as improving the soil may be, more important is the health, happiness, and well-being of the farm family. And I have no hesitation in saying to this group that those of you who believe that income alone will bring satisfactory farm living are terribly wrong. It takes careful planning that must be tied in with the over-all plans for the farm. We have tried it both ways. It works when the two are tied together; it doesn't work when they are not. We want the farm woman in Missouri to help with every step in the farm plan and her husband to help with every step in the home plan. This also goes for the older children. It must be a family approach. This calls for real teamwork if it is going to succeed, at least in a state with the type of restricted resources that Missouri has.

This was well illustrated in two Balanced Farm planning schools that were held for county agents and home agents in South Missouri some years back. At the first school the county agents worked together on developing a practice farm plan on an actual farm while home agents worked on the home plan for the farm. Then each group presented their plan for the other's consideration. When the home agents presented the cost of home improvements needed, the county agents whistled. They had not seen the need and they had not anticipated such expenditures in their plan for farm operations.

Two years later a similar school was held with many of the same agents attending, but this time county agents and home agents worked together in groups to obtain an understanding of all phases of this farm and home planning job. This time when various groups of agents presented the plans they had developed there was no whistling, even though costs for home improvements were larger than before. The men agents knew the needs of that farm home and the women agents knew the income producing possibilities of the farm, and since both had worked together a very important balance has been reached—a balance between the farm and the home. And of course the importance of this family approach is not lessened when it is the farmer and his wife and older children working together on the plan.

We know that we can move production up on the average of 25 to 75 percent by Balanced Farm planning. Our problem is, how can we move more rapidly—how can we interest more farmers? We have 114 counties in our state and we have Balanced Farming work going in every county. However, in 1946 we started in one county with what we call a Balanced Farming Association. Fifty farm families banded together, paid in \$50 each, the businessmen of the community put in \$1250 and the Extension Service put in \$1250 to provide a \$5000 fund with which to hire an associate agent to help these 50 farm families set up Balanced Farming plans. This has been the most helpful device we have found to move sound farm and home planning. In 1947 we had 17 of these associations, in 1948 we had 29, this year we have 37, next year we will have 46. This would represent 45 different counties—one county has two associations. This growth testifies to the effectiveness of this method.

When a farm family puts in their own money to help employ an associate agent who in turn helps them develop a farm and home

plan they are ready to move. People value things that they pay for with money or in work. The things that are given them are not valued so highly. This, I think, accounts for the fact that it is in these associations that we have made real progress in Balanced Farming. Take for example, Lafayette County. They had two Balanced Farming associations in 1948. The county built 269 miles of terraces. The 20 county soil districts in our state built a total of 520 miles of terraces in 1948 according to the SCS reports. Among the 114 counties in the state using nine measures of soil conservation, Lafayette County ranked first in three of them. It was first in miles of terraces built, first in acres contoured, first in terrace outlets built, 6th in tons of limestone used, 7th in number of farms contoured, 10th in number of ponds built, 11th in total acres of sweet clover, 12th in acres of green manure turned under and 15th in tons of fertilizer used. I simply use this as an example to indicate that there is correlation in our state between the progress in conservation, in soil improvement, and in the number of these associations a county has. It is also interesting that in 1946, the same county that first started a Balanced Farming Association started our first soil testing laboratory. Today we have 60 county soil testing labs where a farmer can learn from his own county agent the kind and amounts of fertilizer needed for each of his fields. This is a tremendously significant development and is another by-product of our Balanced Farming program—to help people to help themselves. In the four years since we have started these labs we have increased fertilizer use 50 percent. Missouri is today using 10 times as much fertilizer as it did 10 years ago.

Certainly we have had our ups and downs with these associations. Some have failed, principally because we did not have men available of the type essential to make a success of one of these associations. It takes the very highest type of a county agent. He must be able physically, as well as knowing farming from the ground up, to handle this job. We have 38 of them on the job today and as I said a minute ago, expect to have 46 on the job next year. As the years go by, however, we are going to have the best trained bunch of county agents anybody has ever seen, since it takes real men to do this job. This associate county agent turns first to his county agent and home agent when he hits a hard problem. He is not a superman. If they still have trouble, they have first call on our specialist group for we believe that we have men who, in their

respective fields, know the answers better for the state of Missouri, in water management, farm management, soils, field crops, dairying, animal husbandry, etc., than can be found anyplace else. It is their job to keep these county workers sound. It has been a tremendous challenge to our specialists. They have responded in a magnificent way. As our soils specialist, the chairman of our Balanced Farming committee puts it, "Let's quit fooling with these darn meetings and get out on the farm and get something done."

The essential philosophy in this Balanced Farming approach is that the welfare of the farm family comes first, that you will never improve and conserve the soil unless farmers determine to do it themselves largely with their own resources; that it is just as essential to have a blueprint for the improvement of the farm and home as it is to have one with which to build a barn or a house.

There is one thing of which we are certain and that is that we do not have the final answer. We are convinced that our present methods are effective, but we wonder whether there are not still better ways of getting the job done. We are experimenting right now with a number of different ways of doing farm and home planning. In one county, for example, we are trying out a somewhat less intensive method of planning. The agents in a single year have 85 farms well under way. These are in separate school districts and we expect to try within another year an experiment to see how much we can do in using these 85 men as local leaders who would be willing to help a half-dozen neighbors in setting up their Balanced Farming plans. We are experimenting with this in the hopes that some day the government might recognize that you could put on a great voluntary program of farm planning where you could really get soil conservation and get it paid for at the same time; where you could get real crop adjustment through mass farm planning. It is perhaps wishful thinking that a thing so inexpensive and so simple could ever be incorporated in an over-all farm program. But we know we could make it work in Missouri, so we go on working and hoping that we might have this chance, because with it or without it, we know we are doing one hundred times better Extension work today, getting more practices adopted every year than we ever dreamed of getting before we started with the Balanced Farming approach.

Among the things that we have learned is that to have progress in a venture of this kind facilities must be available. Among those

facilities, I would include farm management companies who will work with the larger farms, the non-resident owner farms, and the farms that would require the close farm management attention that our county agents cannot, or at least should not, give. In our state we have 325 soil moving contractors. They have their own contractors' association, many of which men are former county agents. They have put their money in machinery to build terraces, soil saving dams, ponds, drainage ditches, and that sort of thing. They have the know-how, they can do the work much better than the farmer can do it for himself, and in general we believe it will pay a farmer to hire one of these men and use his own time in developing his livestock enterprise or other things on the farm that will bring in the money with which to pay his contractor. Fertilizer dealers have been a great help in our whole program. In turn we are asking them to stock the kind of fertilizer farmers should have and they are doing it. We must include businessmen in a program of this kind. Our businessmen, particularly our State Bankers Association, help support the Balanced Farming associations. Again, when a man puts his own money into a thing he is proud of it. He talks about it. He boosts it, and all of this helps carry the program. We believe the development of Balanced Farming around any agricultural town helps more than the bringing in of any type of factory or anything of that sort that they could possibly find. Why not allow them the privilege of investing in a really sound development program? Incidentally, we have more difficulty in selling our farmers on this idea of allowing the businessmen to help finance an association than we do the businessmen.

All in all, we believe that the development of the Balanced Farming program has been one of the great things that has happened in our state. We were barely started when the war years took away our younger county agents and pretty well stopped our program. Since the war we are getting under way again and have more than 20,000 farm families in some stage of a Balanced Farming program. It takes years of hard work for a farm family to get a really good program under way. It takes the constant encouragement of the county agents to keep them working at the plan once it is made.

We look forward to the day when a couple of hundred of what we call "graduates" of our Balanced Farming associations may form a more extensive type of association in a county and pay all of the salary of their associate county agent, a man with particular train-

ing in Agricultural Economics, who will not only help keep them on their plan but help them really use outlook information. Such an association would work in groups more than is possible or necessary with the small associations when the individual plan is being developed and started.

As I stated before, we do not know all the answers or any considerable number of them about getting farm and home planning done; but we do think it is the soundest and most fundamental approach, both from the standpoint of the farm family and from the standpoint of the Extensive Service, that we have ever had. With the advice of our farm people we expect to keep on improving our techniques until some day you can ride down *any* of our roads and see good farming and good homes—Balanced Farming—on every hand.

ECONOMICS FOR THE FARMER

LAUREN SOTH

The Des Moines Register and Tribune

MOST of us who are members of this Association are engaged, one way or another, in trying to inform farmers about the economic factors affecting their businesses. It is surprising, therefore, how little time we devote to studying the best methods of doing this job. If we are to raise the general level of understanding of economic facts and principles, we cannot be satisfied merely with increasing the supply of information. We must also be concerned with our responsibilities of exposing the public to the information and of increasing its rate of absorption.

The reasons why it is important that we do a more effective job of transmitting economic information to farmers are self-evident: first, to help them adjust their individual business operations more rationally to a changing economic situation; and second, to help them make sounder judgments about governmental activities in agriculture.

I

When agricultural prices and land values flopped badly after the first World War, the demand for economic information grew enormously. The commercialization of the farming industry had long since reached a point where farmers were conscious of their relationship to the business cycle. There had been agitation for monetary inflation and other kinds of farm relief during the last half of the nineteenth century. But no previous price-cost squeeze had quite the impact on farm thinking of the 1920-21 affair. Farm people began to wonder about the factors which determined their prices. This was the period of heaviest assaults on the packing companies, the grain exchanges, the banks and other institutions which farmers believed were responsible for their difficulties. It led to the flurry of farm co-operative organization, to the McNary-Haugen episode and all sorts of plans for raising farm prices.

It also led to the first systematic effort to educate farmers about economic conditions which affected them. The Wallaces, Henry C. and Henry A., were prime movers in the effort to provide agriculture with more and better economic information. They began to publish charts of "hog profits and losses" in their farm paper, and later added similar diagrams on beef cattle and butter. Later

Henry A. Wallace added statistical information about general wholesale prices, industrial production, employment, carloadings, and other indices of business activity. He also began to publish his own forecasts of prices.

In 1923, Henry C. Wallace, as Secretary of Agriculture, called the first national farm outlook conference. The first outlook report covered only demand conditions and price prospects for wheat, cotton, tobacco, corn and hogs. Little effort was made to give it widespread circulation among farmers.

At the time this outlook work was getting started it was felt by many farm leaders that farmers would make the proper adjustments in crop acreages and livestock programs if they had the facts before them. They thought adequate economic information would prevent surpluses and help stabilize agricultural prices by making the market a more effective instrument for balancing supply and demand. There was even a "forward price" proposal advanced at this time to make the outlook work more meaningful and effective—and to reduce uncertainty in the farm business.

Of course a more perfect market was not the answer to the farm depression of the 'twenties. But because outlook work had been advocated as a panacea, it was discredited when farm conditions didn't get any better and then went from bad to very much worse in the Great Depression of the 'thirties.

Agricultural leaders turned their eyes toward federal government action to adjust production, along with purchases and loans to support prices of farm products. The theory behind these programs was that the free market couldn't be made to balance supply and demand. The idea, in contrast to that embodied in outlook work, was to substitute central direction and management for the automatic regulation of the market.

Although it may be true that the free market system is inadequate to direct the necessary adjustments in agricultural production and marketing in a time of violent economic change, it is fair to say, I think, that we have never done our utmost to try to make it work more efficiently. We haven't given the free market a really fair trial, for it is implicit that a smoothly functioning free market must have as its basis complete, accurate, understandable, and timely economic information to producers.

Neither our national government, our educational institutions, nor the press have been able to achieve anything like a satisfactory

dissemination of such information to farmers. Strangely enough, some of the groups and institutions which argue most vehemently for the free enterprise economy are least willing to spend money in a genuine effort to make it work in agriculture.

II

Paradoxically, the AAA programs have accomplished many times as much in acquainting farmers with economic information as the Extension Service has in all its 26 years of organized outlook programs. Whatever the AAA programs did or did not accomplish in the way of production control, they certainly did provide many farmers who never before had been reached by any educational agency with basic knowledge about the American economy and agriculture's place in it.

Each year in order to get compliance with its programs, the AAA brought to farmers in simple terms the supply and demand situation affecting the crop in question. The interpretation was slanted, of course, to induce farmers to go along with the adjustment. But still farmers were made aware of relationships and magnitudes—the impact of the foreign market, for instance, which they had not previously thought about. You who have worked with farmers during the last 20 years will bear me out on this.

This achievement in the field of economic education by the national farm adjustment programs is something which it seems to me deserves study. What are the reasons why AAA could interest farmers in the foreign market for wheat, when Extension couldn't? You cannot dismiss this question merely by saying AAA had the money, and farmers were interested in their pocketbooks. There is more to it than that.

One reason why AAA was more successful in economic education than the Extension Service was that it used local farmers to do the job. Local people know best what their neighbors are interested in and how to approach them with new information. Extension has always prided itself on its local leader system, and apparently this system has worked well in spreading information about farm production practices. But for some reason, the Extension people were never able to get this job done on *economic* information.

Why was the AAA able to get local leaders to do this job which Extension had been unable to do? Well, the committee-men were paid, for one thing, and Extension's local leaders were volunteers.

But aside from this, AAA had a definite sales argument to put over. It was shooting at a definite goal. The AAA workers were not troubled with doubts about the correctness of their program. They didn't try to bring out the "other side" of the question. Instead, they did their best to sway farmers to their way of thinking. Theirs was a dynamic, crusading movement, and it had a highly interested audience during those depression days. It attracted workers just because it was new and dynamic. Alongside it, the Extension outlook story was drab and dull.

Opinion researchers have found that no matter how skillfully an information campaign is waged, it will fail unless it is geared to the public's interests. All of us know from experience, also, that people learn more in discussion of "hot" or controversial issues than they do when they aren't emotionally worked up about them. We know from the mail which comes into our newspaper that controversy results in a much higher degree of knowledge. The recent outburst of Cardinal Spellman against Mrs. Eleanor Roosevelt unquestionably stimulated thousands of people to become better informed on the issue of public aid to schools, as well as upon the questions of religious freedom and separation of church and state.

The heated arguments over crop acreage control and other aspects of agricultural policy contributed to the wider spread of economic information through the AAA system—both among friends and enemies of the program.

When public interest is high, when controversy is alive, that seems to be the most favorable climate for getting across information. But there is one danger in trying to reach people on the basis of their interests alone. People nearly always seek information congenial with their prior attitudes. They select material to read which fits in with their own biases, and they go to meetings or listen to radio programs which strengthen their own convictions. Thus it is easy for educators, or others in charge of information campaigns, to be misled as to the number of people they are reaching and as to the amount of information they are getting across. The AAA has fallen for this to some extent, I believe. It has done a good job of educating the loyal followers of its programs, but it may not have reached out as far into the byways as it believes. The older AAA becomes the more it falls into the same rut as Extension or any other agency. It clings to its permanent "clientele" and to the methods and techniques it has used in the past.

There is supposed to be a high pitch of interest among farmers in agricultural price programs right now. The last election, according to the experts, was swung to the Democratic side primarily because Midwest farmers didn't like the Republican performance on farm legislation. The Democrats held a big shindig in Des Moines to sell the Brannan Plan and capitalize on this feeling among farmers.

Yet a Gallup poll just over two weeks ago showed anything but a burning interest among farmers in price support programs. A sample of Midwest farmers were asked whether they had been following the discussion of the Brannan Plan and what their opinions of it were. Less than half of them, 43 percent, said they had been following the discussion. Fifty-seven percent had little idea of what the plan was all about.

This should not be so surprising to us when we realize how slow the spread of even simple production information is among farmers. A large number of Iowa farmers still don't feed balanced rations to livestock. It took many years for Iowa farmers to adopt hybrid seed corn, even after it had been proved. We should not expect farmers to follow and grasp complicated economic ideas like the Brannan Plan within a few months. Yet many of our information programs are handled as though *every* farmer were deeply interested, able to start at the same point, and equipped with all the background that the best informed farmers have.

III

The National Opinion Research Center concluded, in the study referred to earlier, that there exists in our population a hard core of chronic "know nothings." Surveys consistently find a certain proportion of the public which is not familiar with any particular event or idea. This group of "know nothings" is the group which we do not reach with the newspapers, the radio, in meetings, or any other way. There is something about these uninformed people which makes them harder to reach, no matter what the level or nature of the information.

Considering the amount of space which the newspapers give to the national debt, the federal budget and related information, I was shocked recently to see a Gallup Poll report which indicated that nearly two-thirds of the people surveyed (64 percent) would make no estimate of the federal budget for the last year. Only six percent were able to place the budget correctly within a range of 35 to 45 billion dollars. Another 30 percent guessed the budget out-

side this very wide range. About the same percentages of ignorance were shown on information about the national debt. Only seven percent of the people were able to place the debt in the range of 225 to 275 billion dollars.

Lack of knowledge of the figures does not mean, of course, that many of these people do not have some concept of the issues in fiscal policy, but it surely is an indication that this kind of information is not widespread.

The size of this bloc of "know nothings," added to the still larger bloc of those who know *little* about economic information is something that newspapermen, educators, and politicians need to give more attention to. The farmers who have inadequate economic information still make decisions about production and marketing on the bases of prejudice, hunch, and guesswork. They make political decisions on the same inadequate grounds—decisions about farm programs, about international trade policy, and about industrial and labor policy.

The problem is both a matter of making democracy work better and of making the free market system in agriculture work better.

IV

Unfortunately, we know very little about how to go ahead with this challenging assignment. We need first of all research on how farmers get information about markets, prices, general business conditions, and so on. Then we need research on how they use this information to form their judgments.

In the absence of better and more scientific groundwork, it seems to me that state college Extension Services and other agencies dealing with farmers could learn something from the experience of the last 15 years.

For one thing, it appears to me that the Extension Services will never do an adequate job of economic education until they become bold enough to deal with controversial issues. I am not advocating that they try to promote a particular point of view, as institutions, in the manner of the AAA. But I do think they ought to give individual staff economists complete freedom to express their views as they see fit on questions of economic policy—insisting only that the *basis* for these views be accurate and unprejudiced facts. Too many of our economic research and Extension programs are circumscribed by the political forces in the states, working through the college administrations. I have seen a good many economic

education programs bog down because they were so insipid. They lacked drive and carry-through because staff members did not feel free to take a position and argue it if it happened to be unpopular with politically-powerful groups. I believe more could be accomplished in economic education among farmers if more economists were free to stand up and be counted on the hot issues.

I have used the AAA as an illustration of this more vigorous and more effective educational approach. I could also cite some of the work done by some labor unions during recent years, and increasingly by farm organizations.

College administrators spend too much time worrying about the effect of their educational programs in the social sciences. They credit discussion leaders who express their own opinions with more influence than they actually have.

Remember, I am talking about *ways and means* of making more farmers acquainted with factual information about economic conditions and issues of the day—not about persuading them to a certain point of view. Strongly opinionated presentation of economic information does not necessarily change the attitudes of the audience. There is ample evidence to show that while some attitudes change, though usually very slowly, information of this kind does not affect attitudes of different people equally, and many not at all.

For example, the AAA fell a long way short of convincing all farmers of the correctness of its approach to agricultural adjustment. The Democrats may gloat about the last election “proving” farmers don’t like flexible price support and want rigid crop controls, but they should not forget the previous two elections when the Midwest farm vote was Republican. One could make just as good a case that farmers were *opposed* to crop acreage restrictions.

The point is that the AAA’s slanted and opinionated presentation of economic information nevertheless got the facts across to many more farmers than a more objective, and duller, method would have.

The CIO does not convince all its members on its numerous policy positions, but its vigorous manner of presentation does increase the absorption rate of a great many facts about prices, wages, industrial production, and other economic indicators. I would recommend to Extension economists, editors, and administrators that they look over some of the publications of both the CIO and AFL for examples of effective economic education. What

these educators should be worried about is not the great effect of their opinions but the *lack of effect* of their dissemination techniques.

This same principle of taking sides and being *for* or *against* something can be applied to outlook information. Many writers of outlook reports are scared to death that they might be wrong in a forecast. I wouldn't be so worried about being wrong as about not being listened to. If an economist who spends all his time studying the economic situation is afraid to form a judgment, how does he expect his readers to form one, or to pay attention to him? In this connection, let me point to the Doane Agricultural Service as an example of effective outlook information. It is not satisfied to present the facts alone. It gives the facts color and meaning by going the next step and forming a judgment. It probably gets across a good deal more outlook information to farmers than many of our state colleges do.

It isn't necessary to go out looking for a fight in order to bring economic information to farmers. But avoiding controversy can be a way of *not* accomplishing much in this field.

While it is important that educational institutions, as institutions, remain objective, this does not mean individual staff members must never commit themselves.

In fairness to the agricultural colleges, we should recognize that it is not easy for them to conduct economic information work about hot political issues. With loyalty investigations rampant in both state and national governments, it takes some courage to try to do an educational job in social science. It is much easier to just pass by anything that looks like it might create trouble. Still, shying away from these issues by the educational agencies, who are best equipped to discuss them and bring out the relevant facts and information, leaves the field to the charlatans and interest groups.

Getting economic information to farmers is at least as important as any other agricultural program being carried on today. It deserves a great deal more study and imagination on the part of educational institutions, government agencies, and the press.

DISCUSSION

GEORGE A. POND
University of Minnesota

Mr. Morse and Mr. Soth are inclined to accuse farm economists in general and extension economists in particular with being unduly cautious

and conservative in their interpretation of the economic outlook to farmers. It might be an interesting study for some enterprising and imaginative graduate student to analyze the "batting averages" of farm economic prognosticators and their appraisal by farmers.

Director Burch develops one point that the other two speakers fail to mention—namely the importance of having the farmer understand the reasoning behind any economic program or planning to which he is a party.

One can hardly believe that either Mr. Morse or Mr. Soth thinks the farmer will be satisfied or most effectively served by the "dope sheet" type of economic outlook, although that could easily be inferred from their papers. I agree with them that farmers would like to have a definite specific statement of the economist's opinion on prospective prices.

Even if the economist has the right advice for the occasion it may have no bearing on the next economic problem that confronts the farm operator. If he has been taught the process of solution, he can apply it to the new problem and get the answer that does fit.

We should be indebted to Mr. Morse for his emphasis on the increasing proportion of farm inputs that involve cash outlay. This is significant from the standpoint of the vulnerability of farmers in depression periods. However there is still a large proportion of fixed costs in farming that cannot be escaped by curtailing production. I question whether any large number of farmers will cease or severely curtail operation voluntarily in the next depression.

The heavy stress Mr. Morse lays on the part government programs play in determining the price outlook for farmers rather negates the emphasis he places on accurate and specific economic forecasts.

Mr. Soth's major emphasis, as one might logically expect of a journalist, is on publicity methods. His comparison of extension methods in the education field with the sales efforts of AAA workers seems hardly an altogether valid one. I also question the significance of his comparisons between the educational methods of economic extension workers and the success of union labor leaders in rallying workers to their program. Here again monetary rewards and various types of coercion make this distinctly a "horse of a different color." To develop successful pressure groups which sponsor programs that may be distinctly uneconomic or to sell them on the basis of misinformation, even if distinctly successful is hardly comparable with extension teaching.

I am sure Mr. Soth does not mean what he seems to imply in lauding the "spell-binder" and the "rabble rouser" because they are able to influence people to action regardless of whether that action is good, bad, or indifferent. Extension and research economists may at times be colorless and prosaic but that is no reason for them to court popular acclaim by pressing a cause just because it can be made to appeal to certain special interest groups. It is better to sell a little sound economics than, by much sound and fury to stimulate a lot of phony thinking.

DISCUSSION

A. SHULTIS

Extension Service, California

Mr. Morse in his closing paragraph states that able farm managers realize that economists cannot always be right in their forecasts but that their best judgment is wanted. This would imply the willingness and ability of the able farm manager to consider the evidence and draw his own conclusions as to the most profitable farming plan for a particular farm. But there are many people managing farms that are not able and might need help. Mr. Morse tells them through the Doane-Agricultural Digest and according to Mr. Soth more effectively than do we in the Extension Service. We should take some lessons. Certainly farmers need more specific and timely information for planning their operations and their buying and selling. Public agencies such as the U.S.D.A. and Federal-State Crop and Livestock Reporting Services and Market News services are doing a bigger and better job all the time. But more and better distribution should be possible even with existing knowledge, funds and personnel.

Mr. Soth makes a case that merely increasing the supply of this economic information won't get it in the hands of farmers. We need to time it as to interest, put it in understandable, useful form and then use all available methods and channels to get it in the hands of farmers in such a way that they will act on it. He feels we must not avoid controversial issues or taking sides. We gain a hearing only on something of intense interest and even then only with an argument and not a dispassionate exposition of both sides.

Managing a farm for highest total profit or smallest loss over the next few years of uncertain prices, production allotments, continuing high costs and additional new scientific and mechanical developments will require high professional competence in the art of farm management. There are many able farm managers but there are far more that need some training and help. Here is a big job with plenty of room for all agencies—public and private.

There is still plenty of room for private professional assistance to many farmers able and willing to pay for service beyond that which can be obtained free. The Doane Agricultural Service of which Mr. Morse is president, is certainly making a large and important contribution to better farming along with many similar agencies and private consultants. It is surprising there is not more of such service available in the far west.

Perhaps one of the most promising methods of applying the art of farm management to the average family farm is through the Balanced Farming Associations in Missouri and the Farm Management Associations in some of the other middlewestern states. The essence of these plans is the payment by the farmer of part of the cost of a farm planning service beyond that obtainable in free educational programs.

The farm family paying part of the cost of assistance was cited by Director Burch as favoring the full development and use of the farm and home plan. Apparently this cost has not been a deterrent to the growth of the Balanced Farming Associations. Lack of trained personnel has been the main deterrent.

Director Burch raises a significant question about tying in the Agricultural Conservation Program with Balanced Farming Plans. We have doubtless heard the suggestion that A.C.P. payments be made only where there is a sound land use plan. Our first reaction is to shudder at a shotgun wedding of such payments to the art of farm management. Farm plans poorly prepared to qualify for an A.C.P. payment might discredit the whole idea of farm planning. On the other hand A.C.P. practice payment to share the cost of a developed farm plan might be merited. Here is a real opportunity as Director Burch says for a great voluntary program to obtain and pay for soil conservation and obtain crop adjustment through mass farm planning. It will need some help from the farm management field.

As a representative of the far west, I should present an alibi regarding our small progress in individual farm planning. It looks good, but we can't seem to make much headway. In California our commercial farms are fairly large and highly specialized with a rather narrow range of adapted and profitable enterprises. But we see many shifts and readjustments coming which will require intelligent reorganization of many individual farm businesses. We must improve our abilities, material and methods in farm planning.

These three papers all present a convincing case for a larger number of workers better trained in the art of farm management.

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INTEGRATING ECONOMIC AND LEGAL THOUGHT ON AGRICULTURAL COOPERATIVES

A. LADRU JENSEN

University of Utah

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THE shift to more government in economic life arises primarily because law in a democracy is not merely a system of authoritative legal materials; it is also a specialized form of social control resulting from organized pressure of economic and political groups in the social order. Probably no better example of political pressure for better bargaining power can be found anywhere than the pressure of American laborers and farmers to gain the legal right to organize for group welfare.

Time permits only a limited consideration of details. What I shall chiefly endeavor to present to you is an outline of the persistent, powerful, and slow moving group forces in their economic and legal aspects, from which is now emerging the modern cooperative corporate associations of farmers in this country.

Common Law and Free Competition

History is replete with the struggles of men to find freedom and economic justice within the legal framework of different social orders.¹ Out from the volumes comes one clear lesson: that while a country is not populated appreciably beyond its optimum relation between numbers and consumable resources, a capitalistic-democratic form of government has insured the largest number the surest political freedom, the strongest financial incentive, the widest economic opportunity, and the greatest individual power to command goods and services.

On the other hand, the very freedoms inherent in a dynamic modern capitalistic democracy have also produced the most and largest private-profit corporations with the greatest concentration of economic power.

As Pericles emphasized, it is a biological rule of life that big fishes live on little fishes. Similarly the freedoms which allowed big corporations to be controlled by a few citizens provided, and to a con-

¹ Toynbee, Arnold Joseph, *The Study of History, Abridgment of Vols. I-VI* by D. C. Summerville, Oxford University Press, 1946.

siderable degree still provide, an easy method for the exploitation of unorganized farmer and consumer groups.²

The legal controls which the common law exercised at about the beginning of the nineteenth century to insure a free and fair exchange of goods and services were relatively simple and usually effective. Both criminal and civil law made illegal all combinations in restraint of trade, except, that partnerships, joint stock associations and a few monopolistic Royal Charter corporations were allowed.³

The laissez-faire economy, following the time of Adam Smith (1723-1790) and David Ricardo (1772-1823), was grounded on the legal principle that the function of government was to preserve free competition between individuals and small unincorporated associations. Except as the law allowed partnerships, joint stock associations and licensed monopolies, it was the duty of the State to destroy every attempt to profit by combinations restraining trade or enhancing prices in any degree.⁴ It was generally believed that if free competition could thus be preserved, business efficiency and

² Nourse, Edwin G., *From Dogma to Science in Cooperative Thinking*, American Cooperation, American Institute of Cooperation, Washington, D. C., 1946, pp. 10-11.

See also: Berle Jr., Adolf A., and Means, Gardner C., *The Modern Corporation and Private Property* The Macmillan Co., N. Y. 1933

The classical statement on exploitation of farmers by parties more strategically situated was quoted by the United States Supreme Court in the case of *Liberty Warehouse Co. v. Burley Tobacco Growers Co-operative Marketing Ass'n* (276 U.S. 71, 1928) from the Kentucky Supreme Court as follows:

"We take judicial knowledge of the history of the country and of current events and from that source we know that conditions at the time of the enactment of the Bingham Act were such that the agricultural producer was at the mercy of speculators and others who fixed the price of the selling producer and the purchasing price of the final consumer through combinations and other arrangements, whether valid or invalid, and that by reason thereof the former obtained a grossly inadequate price for his products. So much so was that the case that the intermediate handler between the producer and the final consumer injuriously operated upon both classes and fattened and flourished at their expense. It was and is also a well known fact that without the agricultural producer society could not exist and the oppression brought about in the manner indicated was driving him from his farm, thereby creating a condition fully justifying an exception in his case from any provision of the common law, and likewise justifying legislative action in the exercise of its police power." (208 Ky. 649, 271 S.W. 695.)

³ See: Oppenheim, S. Chesterfield, *Cases on Trade Regulation*, West Pub. Co., 1936, p. 8 For a brief history of Royal Charter corporations which were chartered monopolies in foreign trading, such as the Hudson Bay Fur Company and East India Company, see: Williston, Samuel, *History of the Law of Private Corporations Before 1800*, 2 Har. L. Rev. 109.

⁴ Oppenheim *supra* note 3 quotes from Blackstone and Coke: "In England the original and narrow meaning of 'monopoly' was 'a license or privilege allowed by the King for the sole buying and selling, making, working or using of anything whatsoever, whereby the subject in general is restrained from the liberty of manufacturing or trading which he had before.' Also associated with the problem of monopoly were the early common law offenses of engrossing, forestalling and regrating."

fair prices would result and thus the general welfare would be insured. The economic results in a large measure justified the belief in competitive individualism as an efficient regulator of industrial and commercial life.

Thus, if two or more partnerships, joint stock associations, laborers or farmers contracted or combined to gain a financial advantage in the market they were guilty of an illegal conspiracy in restraint of trade and could be prosecuted criminally⁵ at the option of the State or enjoined in a civil action in a court of equity at the option of an interested citizen.⁶

As late as 1913, the Supreme Court of Iowa invoked the common law doctrine of illegal conspiracy against the Decorah Farmers Cooperative Society because a local group of farmers had voluntarily associated together to jointly demand a slightly higher and fairer price than Mr. Reeves, the Chicago buyer, was willing to pay for their hogs.

The court did not analyze whether its own duty was to equalize as far as possible the bargaining power of the farmers against that of the big packing company of Chicago whom Mr. Reeves represented. It enforced the traditional, but now economically outmoded, common-law doctrine that free competition between individual sellers and buyers must be upheld, even if the latter possessed the advantage of quasi-monopolistic bargaining power.

A permanent injunction was decreed against the enterprising Decorah hog raisers. The court thus dissolved the cooperative society and relegated the farmers once again to the disadvantageous position of competitive individual selling of their livestock at wholesale prices, while at the same time they were compelled to pay retail prices for the things they purchased.

It is pleasing to note that this bad decision is one of the last in this country to deny to farmers the right to organize a cooperative through which to jointly market their products.

Industrial and Legal Inventions Concur

Limits of time preclude even a highlight tracing of the concurrent growth of industrial inventions and assembly line techniques on

⁵ *Rex v. Bykerdike*, Lancaster Assizes, 1832, 1 Moo. & R. 179; *People v. Fisher* 14 Wendell 9, N.Y. (1835). In the latter case the New York court reaffirmed the principle that it was a criminal conspiracy to combine and strike for a raise in wages; and *State v. Donaldson* 32 N.J. Law 151, 90 Am. Dec. 649 (1867).

⁶ *Reeves v. Decorah Farmers' Co-operative Society*, 105 Iowa 194, 140 N.W. 844 (1913).

the one hand, and of their legal counterparts: parent and subsidiary corporations,⁷ holding companies,⁸ voting trusts,⁹ affiliated corporations by use of interlocking directorates and non-par stock.¹⁰

Suffice to say that all anti-trust attempts to restrict the growth of big corporations and corporate combinations, met with little success except in the relatively limited field of Public Utility Regulation.¹¹ Here by the use of rate making powers a fair profit was usually defined as, and enforced at, approximately six percent on invested capital.

During the last half of the nineteenth century private-profit corporations of all kinds grew and flourished—through stock acquisitions, consolidations and mergers. Their perpetual life, limited liability for members, centralized management and capacity to command the best professional skills, all made for rapid and extensive accumulations of capital, and of surplus profits. For a time their indirect benefits of efficient production appeared to outweigh the evils of their great quasi-monopolistic power. About 1880 many courts, and the business and financial interests generally began to praise big corporations more than they condemned them.¹² Mechanization and corporate efficiency did supply an increasing flow of goods and services, usually at reduced prices.

By 1890, however, labor and agriculture generally realized that their bargaining ability to extract their just economic due from the total annual goods and services was feeble when compared with the bargaining power of capitalistic corporate groups inherent in the pricing power of big corporations.

Nevertheless Congress was not yet ready to increase the bargaining power of labor and agriculturists by allowing them to combine for group welfare. Congress resolved upon one last vigor-

⁷ Latty, Elvin R., *Subsidiaries and Affiliated Corporations*, Foundation Press, Brooklyn, N.Y. (1936).

⁸ Berle and Means, *The Modern Corporation and Private Property*, The Macmillan Co., N.Y. (1933) pp. 91, 203-206, 212, 319.

⁹ Cushing, Henry A., *Voting Trusts*, The Macmillan Co. (1927).

¹⁰ Ballentine, Henry, *Non Par Stock—Its Use and Abuse*, 57 Am. L. Rev. 233 (1923).

¹¹ Public Utility regulation by the states gained impetus by the enactment of the Interstate Commerce Commission Act of 1887, 43 Stat. 801, 49 U.S.C.A. Sec. 1 et. seq.

¹² Justice Field in writing the decision of the Court in the Railroad Tax case of *San Mateo County v. Southern Pacific Railroad* (Cir. Ct. D. Calif.) 13 Fed. 722, 743 (13 Fed. 722, 743 (1882)) sang the praises of the corporations, as follows: "As a matter of fact, nearly all enterprises in this state, requiring for their execution an expenditure of large capital, are undertaken by corporations."

ous effort to curb big profit-corporations and to try to make them compete with each other in the public interest. This economic judgment and objective was implemented by the enactment of the Sherman Anti-Trust Act of 1890.¹³

There were, however, courageous legal-economic scholars on supreme courts in many places who thought the Sherman Anti-Trust Act was inadequate. They saw more clearly the difficulties of curbing the growth or activities of business corporations. They declared a new duty for both legislatures and courts: namely, to help equalize bargaining power of competing economic classes by making and enforcing laws to strengthen labor and agriculturists against the enhanced economic power of big business corporations.

For a few decades these thinkers were the dissenters, but slowly their economic views gained wider acceptance.

Justice Oliver Wendell Holmes was the greatest dissenter of them all. With broad vision, wise understanding and resolute courage he led the vanguard of a newly forming economic-legal thought. In the *Vegeahn* labor case of 1896,¹⁴ in which the majority of the court denied a right of peaceful picketing, Justice Holmes wrote one of his most classical dissents, as follows:

It is plain from the slightest consideration of practical affairs, or the most superficial reading of industrial history, that free competition means combination, and that the organization of the world now going on so fast means an ever increasing might and scope of combination. It seems to me futile to set our faces against this tendency. Whether beneficial on the whole, as I think it, or detrimental, it is inevitable, unless the fundamental axioms of society, and even the fundamental conditions of life, are to be changed.

One of the eternal conflicts out of which life is made up is, that between the effort of every man to get the most he can for his services, and that of society, disguised under the name of capital, to get his services for the least possible return. Combination on the one side is patent and powerful. Combination on the other hand is the necessary and desirable counterpart, if the battle is to be carried on in a fair and equal way.

The economic argument of Justice Holmes was just as applicable to a right for farmers to combine to get a fair price for their products as it was for labor to combine to get a fair wage for its services.

Following the enactment of the Sherman Act in 1890 many states passed anti-trust laws. Some even placed anti-trust provisions in

¹³ 26 Stat. 209 (1890), 15 U.S.C.A. Sec. 1 et seq. (1940).

¹⁴ *Vegeahn v. Gunter* 187 Mass. 92, 44 N.E. 1077 (1896).

The principle of this dissent was upheld in 1921 by the United States Supreme Court, Chief Justice Taft writing the decision in the case of *American Steel Foundries v. Tri-City Central Trades Council* 257 U.S. 184, (1921).

their amended constitutions in an endeavor to check the concentration of capital and the growth of corporate powers.

Illinois passed an anti-trust statute in 1893 which declared criminal and void any combination of two or more persons, firms, corporations, or association of persons, to restrict trade, to affect the price of a commodity, or to prevent competition on an individual basis in the manufacture, transportation, sale or purchase of merchandise, products or commodities, except "that this act shall not apply to agricultural products or livestock while in the hands of the producer or raiser."¹⁵

In 1902 the Supreme Court of the United States held the Illinois antitrust statute unconstitutional and void in the *Connelly Case*¹⁶ on the ground that it favored farmers and thus violated the equal protection clause of the 14th Amendment. The court, with only Mr. Justice McKenna dissenting, said that the separate classification of agriculturists was arbitrary and capricious, since all persons mentioned in the statute fell within the same general class: persons engaged in domestic trade.

The dissent of Mr. Justice McKenna upheld the Illinois legal classification as fully warranted by the difference between farmers and city merchant men.¹⁷ His discerning dissent, as we shall see, became the opinion of the Supreme Court in 1940 in *Tignor v. Texas*.¹⁸

Reasonable Enhancement of Price Allowed After 1911

The Supreme Court of the United States diligently endeavored for about fifteen years to enforce the Sherman Anti-Trust Act in the spirit in which Congress wrote it, namely, that "every contract, combination in the form of trust or otherwise, or conspiracy, in

¹⁵ See: *Connolly v. Union Sewer Pipe Company* 184 U.S. 540, 554 (1902).

¹⁶ *Ibid.* The 14th amendment declares in part that "No state shall deny to any person within its jurisdiction the equal protection of the laws."

¹⁷ Mr. Justice McKenna aptly observed in his dissent in the *Connolly Case* as follows: "The excluded class is composed of farmers and stock raisers while holding the product or livestock produced by them. The included class is composed of merchants, traders, manufacturers, all engaged in commercial transactions. That is, one class is composed by persons who are scattered on farms; the other class is composed of persons congregated in cities and towns, not only of natural persons but of corporate organizations. In the difference of these situations, and in other differences which might occur to any reflection, might not the legislature see differences in the opportunities and powers between the classes in regard to the prohibited acts?"

¹⁸ *Tignor v. Texas*, 310 U.S. 141 (1940).

restraint of trade or commerce among the several states"¹⁹ was a misdemeanor and also illegal by civil law. This codification of the common law against monopoly and engrossing²⁰ was for the chief purpose of preventing an "enhancement of price" by reason of contract or combination of the corporation concerned.

By 1911, however, almost the entire membership of the Supreme Court decided that the common law doctrine that all restraints of trade were illegal just could not be legally enforced in a corporately organized economy. The court's only alternative was to make a new legal doctrine compatible with the admitted existence of expanding corporate combinations. The new doctrine allowed the courts to try to curb selfish corporate actions for excessive economic gains of the control group and the investors, while it required the court to determine that some corporate combinations did not enhance, or attempt to enhance, price unduly. The United States courts must now distinguish between good and bad corporate combinations. This inevitable decision was fraught with unknown risks and hazards for it was a venture into uncharted legal-economic seas.

In 1911 the United States Supreme Court announced "the rule of reason" in the *Standard Oil Company*²¹ and the *American Tobacco Company*²² cases with only Justice Harlan dissenting. Henceforth not all combinations restraining trade would be held illegal but only those which unduly or unreasonably enhanced or attempted to enhance the price of commodities or products. We shall trace this idea into the spirit and language of the Capper-Volstead Act²³ passed eleven years after these decisions.

¹⁹ See note 13. In *Northern Securities Co v United States* 198 U.S. 197 (1904) the Court observed: "A partnership is not a contract or combination in restraint of trade between the partners unless the well known words are to be given a new meaning invented for the purpose of the Act."

²⁰ *Standard Oil Company v United States* 221 U.S. 1, 4, (1911).

²¹ *Ibid.* The court, Mr. Chief Justice White writing the opinion in the *Standard Oil Company* case said,

"To treat as condemned by the Act all agreements under which, as a result, the cost of conducting an interstate commercial business may be increased would enlarge the application of the act far beyond the fair meaning of the language used. There must be some direct and immediate effect upon interstate commerce in order to come within the act"

If the criterion by which it is to be determined in all cases whether every contract, combination, etc., is a restraint upon trade within the intendment of the law, is the direct or indirect effects of the acts involved, then of course the *rule of reason* must be the guide."

²² *United States v. American Tobacco Company* 221 U.S. 106 (1911)

²³ 42 Stat. 888 (1922), 7 U.S.C.A. Secs. 291-292 (1940).

Section 6 of the Clayton Act

The establishment of the rule of reason had opened Pandora's Box of political pressures for economic group advantage. Within three years after the Supreme Court announced the "rule of reason" the classical dissent of Justice Holmes in the *Vegeahn* case, *supra*, became Congressional policy with the enactment of Section 6 of the Clayton Act²⁴ of 1914, both as to labor and farmers. The right of these economic classes to organize for mutual self help was for the first time recognized by Congress. Thus in 1914, it became legal for laborers and farmers to impose at least reasonable organizational restraints upon interstate commerce for the purposes, respectively of securing higher wages, and higher prices for agricultural commodities and increasing their bargaining power in a predominantly corporate economy.

Section 6 of the Clayton Act was construed favorably by the Federal District Court for Oregon in *United States v. Dairy Cooperative Association*²⁵ in 1943. In quashing the indictment for alleged criminal conspiracy to enhance the price of milk Judge McCollough wrote:

I am told this is the first case brought by the Anti-Trust Division of the Department of Justice against a farmer's cooperative acting alone and not in concert with others. . . . I am asked to scuttle the plain language of the Clayton Act as to cooperatives, as the anti-labor courts scuttled the labor provisions of the same act. When Congress said that cooperatives were not to be punished even if they became monopolistic it would be ill-considered for me to hold to the contrary.

The Capper-Volstead Act of 1922

While the Clayton Act, *supra*, authorized the organization of non-profit, *non-stock* cooperative corporations, the right of agriculturists to organize cooperative corporations was given much broader sanction by the enactment of the Capper-Volstead Act²⁶ in 1922.

²⁴ 38 Stat. 730 (1914), as amended 15 U.S.C.A. Secs. 12-27. Section 6 of the Clayton Act reads: "The labor of a human being is not a commodity or article of commerce. Nothing contained in the antitrust laws shall be construed to forbid the existence and operation of labor, agricultural or horticultural organizations, instituted for the purpose of mutual help, and not having capital stock or conducted for profit, or to forbid or restrain individual members of such organizations from lawfully carrying out the legitimate objects thereof; nor shall such organization or the members thereof, be held or construed to be illegal combinations or conspiracies in restraint of trade under the anti-trust Laws."

²⁵ *United States v. Dairy Cooperative Association*, 49 Fed. Supp. 475 (D. Ore. (1943)).

²⁶ 42 Stat. 888 (1922), 7 U.S.C.A. Secs. 291-292 (1940).

By this Act Congress granted the legal right to agriculturists to organize stock as well as non-stock cooperative corporations. So long as the organization and operation of an agricultural cooperative marketing corporation did not "unduly enhance the price" of the products marketed, it was exempt from the provisions of the Sherman Anti-Trust Act.

The Capper-Volstead Act also inaugurated the principle of the determination of a fair price for agricultural commodities which expanded enormously under the Office of Price Administration during the second World War, for it gave the Secretary of Agriculture the right and duty of determining when the price of an agricultural product had been "unduly enhanced," that is, enhanced above a fair price, by reason of cooperative corporate organization or operation, or both. This difficult economic task has not often been exercised by the Secretary of Agriculture.

The Capper-Volstead Act also contains the beginnings of a legislative definition of a true cooperative.

In order for a cooperative to gain limited anti-trust immunity under the Sherman Anti-Trust Act, interpreted by the "rule of reason," four requirements are set out. The requirements for qualification as a Capper-Volstead cooperative are:

First, The cooperative corporation must be organized only by agriculturists.

Second, Each association must be operated for the mutual benefit of the members thereof as producers except as to parent subsidiary cooperatives which are allowed under the Act.

Third, The association shall not deal in the products of non-members to an amount greater in value than those handled by it for members.

Fourth, The association must conform to one or both of the following:

- a. One member, one vote, irrespective of capital owned, or
- b. Dividends on stock or membership capital shall not exceed eight percent.²⁷

The Capper-Volstead Act is truly the Magna Charta of cooperative agriculture.²⁸

Three of the above incidents of an agricultural cooperative are found in the rules of the early Rochdale Equitable Purchasing Cooperative of England where in about 1844, twenty-eight friends and fellow craftsmen formed a new type of unincorporated, non-profit, joint stock association to purchase necessities at a saving

²⁷ Note 23.

²⁸ See Jensen, A. Ladru, *The Bill of Rights of U.S. Cooperative Agriculture*, 20 *Rocky Mountain Law Review*, 181-189 (Feb. 1948).

over what they were required to pay in the ordinary retail market.

Mr. Edwin G. Nourse states the essence of the Rochdale dogma thus:

If you require every member to buy a share of capital stock and limit the amount any one member may hold, if you give each member only one vote, if you put a low ceiling on interest paid to purchasers, follow market prices, sell for cash, and return any residue in proportion to patronage, you have a cooperative.²⁹

We shall examine further statements as to the essentials of a cooperative after first observing how the Capper-Volstead Act has fared in the United States Supreme Court.

Six years after its enactment the Act received favorable recognition by the Supreme Court in the case of *Liberty Warehouse Co. v. Burley Tobacco Growers' Co-op. Marketing Association*.³⁰ In a unanimous decision the court said:

It is stated without contradiction that cooperative marketing statutes substantially like the one under review (Ky. Bingham Act, 1922) have been enacted by forty-two states. Congress has recognized the utility of cooperative associations among farmers in the Clayton Act, 38 Stat. 730; the Capper-Volstead Act, 42 Stat. 388; and the Cooperative Marketing Act of 1926, 44 Sts. 802. These statutes reveal widespread legislative approval of the plan for protecting scattered producers and advancing the public interest. Although frequently challenged, we do not find that any court has condemned a single feature of the plan with the single exception of the Supreme Court of Minnesota.³¹

Although the *Liberty Warehouse* case indicated that agricultural cooperatives were held in high favor by the court, nevertheless the case did not overrule the *Connelly Case*, *supra*, which held invalid the exemption of cooperatives from the Illinois Anti-Trust Law, but side-stepped it. The Warehouse Company, with all other persons was forbidden to induce a member of the cooperative to refuse to

²⁹ Nourse, Edwin G., *From Dogma to Science in Cooperative Thinking*, American Cooperation, American Institute of Cooperation, Washington, D.C. (1946) p. 9.

³⁰ *Liberty Warehouse Co. v. Burley Tobacco Growers' Cooperative Marketing Association*, 276 U.S. 71 (1928).

³¹ *Ibid.* In addition to the statutes above cited a partial list of federal statutes supporting cooperatives are: The War Finance Corporation Act of 1918; The Packers and Stockyards Act of 1921, 42 Stat. 159, 7 U.S.C.A. 181; The Grain Futures Act of 1922, 12 Stat. 993, see *Board of Trade v. Olsen*, 262 U.S. 1, Federal Intermediate Credit Bank Act of 1923, 42 Stat. 1454, 12 U.S.C.A. 1021; Agricultural Marketing Act of 1929, 46 Stat. 11, 12 U.S.C.A. 1141; Farm Credit Act of 1933 authorizing the banks for cooperatives, 48 Stat. 257, 12 U.S.C.A. 1184, Robinson Patman Act of 1936, 49 Stat. 1526, 15 U.S.C.A. 13, The Rural Electrification Act of 1936, 49 Stat. 1363, 7 U.S.C.A. 901 and the Commodities Exchange Act of 1936, 49 Stat. 1491, 7 U.S.C.A. 451.

perform his marketing contract upon a statutory penalty of \$500 for so doing. The court said, "There is no basis on which to invoke the equal protection clause on which the Connelly Case was decided." So the question was left open for a later decision.

In 1940 Justice Frankfurter wrote the opinion of the Supreme Court in the case of *Texas v. Tignor*.³¹ The Texas Anti-Trust statute had general application except that it did not apply "to agricultural products or livestock in the hands of the producer or raiser." The Court overruled the old Connelly case, *supra*, of 1902 and held that the Texas statute was not violative of the equal protection clause of the 14th Amendment but was reasonable classification.

The Court in adopting the reasoning of the dissent of Justice McKenna in the Connelly Case, *supra*, said:

Since Connelly's Case was decided nearly forty years ago, an impressive legislative movement bears witness to general acceptance of the view that the difference between agriculture and industry calls for differentiation in the formulation of public policy. The states as well as the United States have sanctioned cooperative action by farmers; have restricted their amenability to anti-trust laws, have relaxed their organizations from taxation.

Congress and the states have sometimes thought it necessary to control the supply and price of agricultural commodities within their respective spheres of jurisdiction and the constitutional validity of these measures has been sustained. . . .³²

These various measures are manifestations of the fact that in our national economy agriculture expresses functions and forces different from the other elements in the total economic process. . . . The Fourteenth Amendment . . . does not require things which are different in fact or opinion to be treated in law as though they were the same. And so we conclude that to write into law the differences between agriculture and other economic pursuits was within the power of the Texas legislature.

The legal right of agriculturists to organize large parent-subsidiary, federated cooperative corporations to help enhance the price of their products to a fair price³³ is now firmly established. This does not mean however that agricultural cooperative corporations may contract or combine with other persons, natural or corporate, to enhance the price of agricultural products marketed by the cooperative even if the price by so doing would not be unduly enhanced.

³² Note 18.

³³ *Ibid.*, see: *Milford v. Smith* 307 U.S. 38, 83 L ed 1092, 59 S Ct 648; *United States v. Rock Royal Cooperative*, 307 U.S. 533, 83 L ed 1446, 59 S Ct 993; *Nebbia v. New York* 291 U.S. 502, 78 L ed 940, 54 S Ct 505, 89 ALR 1469.

The contract or combination with a third party to stabilize, enhance or affect prices, was held to be violative of the Sherman Anti-Trust Act in *United States v. Borden Company*.³⁴

The Court held that when the Pure Milk Association, a lawful cooperative under the Capper-Volstead Act, combined with a drivers' union, a Chicago milk distributor, and the Chicago Municipal authorities to control the Chicago milk market, such attempt irregardless of whether the present price was fair or not was an illegal conspiracy under the Sherman Anti-Trust Act, and the Capper-Volstead Act was no protection to the Pure Milk Cooperative Association which had become one of the parties to the illegal combination.

Bargaining Power and Income Tax Exemption

By a provision in the Federal Income Tax Act of 1926³⁵ continued to the present time, agricultural cooperative associations whether incorporated or not may qualify for so-called tax exempt status if they meet eight specific legal requirements which we shall examine shortly.

The phrase "so-called tax exemption" is used to call attention to the confusion existing in the minds of many people who erroneously believe that patronage refunds, paid to members by reason of a contract obligation to do so existing prior to the receipt of income, are deductible from cooperative income in determining Federal income tax, if any. The cooperatives are not exempt from taxes on these funds. Patronage refunds are not deductible, but are excludable from the gross income of the cooperative agent and includable in the gross income of the principal, patron member. The only income that is legally exempt in a true cooperative is amounts used to pay dividends on capital and possibly some limited reserves in some cases.³⁶ Whether a cooperative gains exemption on amounts paid out as dividends and in some cases on some accumulated reserves, or operates as an agent at cost and avoids accumulation of taxable income by remitting, under prior contract obligation, all profits to its patrons as principals—in

³⁴ *United States v. Borden Company* 308 U.S. 188 (1939) reversing 28 F. Suppl. 177. For detailed analyses of this case see Hanna John, *Anti-Trust Immunities of Cooperatives*, Law and Contemporary Problems, Duke University School of Law Vol. 13, Summer 1948, pp. 488-504.

³⁵ 48 Stat. 608 (1926), 26 U.S.C.A. 101 (12) (1940).

³⁶ *Commissioner of Internal Revenue v. American Box Shook Export Co.*, 1946, 156 Fed. 2d 629.

either or both events the economic return and bargaining power to the individual cooperators is enhanced.³⁷

We have already made reference to the Rochdale tests of a true purchasing cooperative. We have also summarized the statutory requirements of an agricultural marketing cooperative under the Capper-Volstead Act, *supra*. With the exceptions of the basic partnership idea of one man, one vote, and of a too-high dividend allowance in view of our experience with low interest rates following the great depression of the 1930's, the statutory definition found in the Internal Revenue Code, Section 101 (12) of a so-called tax exempt cooperative appears to be probably the best definition of a "pure" or true cooperative yet evolved.

Frank Robotka recently called for new thought patterns on cooperatives and offered his analysis of "An economic concept of a 'pure' cooperative" in part as follows:

Every true cooperative represents an effort on the part of two or more autonomous units jointly to conduct, coordinately with each other, given operations essential to the economic activity of member units. It is the avowed purpose of true cooperators not to interpose a business enterprise in the usual sense between themselves and their market. In a technical economic sense, this can mean only that it is their purpose to function in their own capacities as sovereign units, that is, to perform designated functions or services as integrated with their individual economic pursuits.

The cooperative organization consists of the sum of the relationships and arrangements established among member units in order to effectuate their purpose. In an economic sense, these arrangements are designed to enable member units jointly to participate in the performance of their entrepreneurial functions with respect to the given activities which they desire to conduct in coordination with each other.

An integrated operation does not constitute an independent profit-making unit, that is, a "firm." Such an operation is a branch or a department of the integrating unit or, as is the case in a cooperative, of a group of integrating units.³⁸

Although Dr. Robotka's economic language is strange to the lawyer, the legislators and the courts, the concepts have their clearly recognizable counterparts in statutory provisions and

³⁷ An excellent and most comprehensive article dealing with taxes and bargaining power is: Paul, Randolph E. (Tax advisor to U.S. Treasurer, 1942-44), *Justifiability of the Policy of Exempting Farmers' Marketing and Purchasing Cooperative Organizations from Federal Income Taxes*, 29 Minn. Law Rev. 343-375 (May 1945). See also, *Tax Liability of Cooperatives*, Commerce and Industry Association of New York, Inc., New York, N.Y. 1946.

³⁸ Robotka, Frank, *Lego-Economic Implications in Cooperation*, American Cooperation, American Institute of Cooperation, Washington, D.C. (1946), pp. 522-533.

court decisions, including some judicially defined cooperative terminology.³⁹

The eight statutory requirements for a cooperative to gain tax exempt status under Internal Revenue Code 101 (12) are:

1. The association must be organized by farmers on a cooperative basis.
2. It must operate, as a marketing or purchasing agency or both, on a cost basis, ultimately turning back all net proceeds to member and non-member patrons on a basis either of quantity or the value of the products furnished.
3. Substantially all stock except non-voting, non-profit-sharing preferred stock must be owned by producers or purchaser-member patrons.
4. Dividends may not exceed eight percent or the legal rate in the state of incorporation, whichever is greater.
5. Only reserves required by state law, or reasonable reserves for any necessary purpose may be accumulated.
6. Neither the cooperative nor its member patrons may gain a discriminatory advantage on non-member business.
7. Non-member business must not exceed member business.
8. Agricultural cooperatives are limited in their purchases for non-member non-producer patrons to 15 percent of total business. Business done with the U.S. or its agencies is to be excluded in determining the right to exempt status.⁴⁰

My comment on the difference in definition of a cooperative by the economist and by Congress is that the former may be in part theoretical while the language of the legislatures and the courts is the final word; the ultimate in social control.

In integrating economic and legal thinking on Cooperative Corporations more exchange of points of view is imperative. It would be extremely helpful to have every school or department of economics place in its library a comprehensive legal dictionary; if possible, the 45 volumes called "Words and Phrases"⁴¹ which gives the judicially construed definitions of all lego-economic terms that have been defined by supreme courts of this country and England, and induce the students and professors to make extensive use of such materials.

Consumers and Cooperatives

The evolution of cooperative associations has been sketched as a struggle of farmers for increased bargaining power and the adapta-

³⁹ Jensen, A. Ladru, Terminology in Cooperative Corporation Law, Proceedings Section of Corporation, Banking and Mercantile Law, American Bar Association 1948, The Business Lawyer, Nov. 1, 1948, pp. 226-236.

⁴⁰ Note 35.

⁴¹ Words and Phrases, West Publishing Company, St. Paul, Minn. 1940.

tion of the non-profit corporation to off-the-farm marketing and purchasing operations.

The farmer must continue to work on his farm. He however, wants his off-the-farm operations to be carried on with as much efficiency as corporate organization, capital, and specialized skills can give, compatible with his retention of ultimate control in selecting directors, and of statutory partnerships organization for the limited purpose of receiving all pro rata net income above cost of operation of his non-profit corporate agent or trustee or both.⁴²

We have not mentioned that consumers, as such, remain largely unorganized in our dominantly corporate economy. One of the public relations tasks of cooperatives is to get the facts to consumers that marketing cooperatives can and do process and distribute food cheaper than was done, or can be done, by profit middlemen whom the cooperatives have replaced in part and are replacing.

Economic research supports this thesis⁴³ and a number of courts have taken judicial notice of this fact in various cases.

The Supreme Court of Wisconsin in the case of Northern Wisconsin Co-op. Tobacco Pool v. Bekkedal⁴⁴ wrote:

The reasons for promoting such (cooperative) legislation are generally understood. It sprang from a general, if not well-nigh universal, belief that the present system of marketing is expensive and wasteful, and results in an unconscionable spread between what is paid the producer and that charged the consumer. It was for the purpose of encouraging efforts to bring about more direct marketing methods, thus benefiting both producer and consumer, and thereby promoting the general interest and the public welfare that the legislation was enacted.

It is small wonder that the courts almost unanimously declare cooperative corporations to be in the public interest when by some enhancement of price to the sellers they still establish greater efficiency in processing and marketing operations and get consumer goods to the purchasers at reduced prices.

Cooperatives v. Middlemen

It is reliably reported as an economic fact that about thirty-five years ago middlemen handled practically all grain that went through the Minneapolis-St. Paul market, and that today the

⁴² Bogardus v. Santa Ana Walnut Growers Assn. 41 Cal. App. 2d 939, 108 p. 2d 52 (1940).

⁴³ Bakken and Schaars, *Economics of Cooperative Marketing*, McGraw-Hill Book Company, 1937, pp. 199-200.

⁴⁴ Northern Wisconsin Cooperative Tobacco Pool v. Bekkedal, 182 Wis. 571, 197 N.W. 936, (1923).

farmers cooperative marketing corporations handle more than 20 percent of the grain which goes through that market, and with a substantial, exemplary savings to the farmer-cooperators.

This economic conflict between cooperatives and the middlemen whom they replace impinges at present in the concerted effort of middlemen dealing in agricultural products and production supplies to enlist all non-cooperative business in a campaign for legislation to tax patronage refunds of cooperatives.

The real problem in this regard is not the competition between the corporately associated farmers, and the middlemen dealers in farm products and production supplies, who directly compete with each other. Competition, if allowed to continue and if cooperatives steadily become more efficient, will eventually solve this problem in the good old American way.

The present problem of farm economists, cooperative corporation lawyers and other cooperative leadership is: how to marshal and disseminate most effectively the economic truth that cooperative corporations cannot and will not replace the bulk of non-cooperative, non-agricultural business if it remains efficient and operates in the public interest. The uninformed fear of non-cooperative businessmen who do not deal in agricultural products or supplies must be replaced with the quieting truth that a strongly organized cooperative agriculture will be a bulwark to a more freely competitive capitalistic democracy, and an anchor against the winds of "Statism."

The economic truth that non-cooperative corporate business can preserve its competitive position in most non-agricultural fields is borne out by the history of cooperative corporate growth in Switzerland and the Scandinavian countries. After fifty years of experience among the realistic Swedes private-profit corporations and non-profit cooperative corporations have found where each can best serve the public. Today they live happily side by side. Last year they teamed together to fight both nationalization and the Communists in the Swedish Riksdag.⁴⁵

Our problem is not only a better integration of economic and legal thought. It is a psychological and public relations one as well. The businessman who does not compete with agricultural cooperatives is one of the publics of the cooperatives. Good public relations

⁴⁵ Wallace, Ralph, Sweden—Land of Light, Reader's Digest, Aug. 1949, pp. 112-116.

require that this group of businessmen be educated to the truth of the finding by the National Association of Manufacturers: that cooperatives are "a legitimate form of private enterprise."⁴⁶

Bargaining Power of Industrialists, Laborers and Farmers

We have sketched the rise of bargaining power of labor unions and of farmers' cooperatives after gaining their legal right to organize for mutual self help by the Clayton Act of 1914. Since that time the bargaining power of labor, through broader and firmer organization, has grown much more rapidly and to a much greater degree than has the bargaining power of agriculturists.

Two and a half years after World War II, the average price of all agricultural products have fallen from their war time highs by about 30 percent, while the wages of organized labor have not fallen at all. This shows an unhealthy disparity between agriculture and labor. Neither have cooperatives yet grown strong enough to aid much in preventing harmful agricultural surpluses.

The pendulum of bargaining power has swung much further toward labor than it has toward agriculturists. Large corporations are still able to raise prices to absorb increasing costs and return a handsome profit. Truly "the rule of reason" and the Clayton Act opened Pandora's box of political pressurers and we struggle for a solution of momentous new problems.

Our economy has passed from the era of free individual competition when the simple common law outlawed all conspiracies in restraint of trade, to a legislative-judicial attempt to establish a workable allocation of bargaining power to non-cooperative corporate groups, labor unions, and farmers. The problem is tremendously big and complex.

The solution must be found in the integration of politics, economics, law, education and public relations with a spiritual aim toward the public interest in the minds and hearts of the leadership of every segment of the American economy. Otherwise, we will lose our heritage of freedoms, because of ignorance, selfishness, and a lack of diligence and cooperation among pressure groups of our society.

⁴⁶ NAM and Cooperatives, National Association of Manufacturers, New York, N.Y., 1946, p. 7.

INTEGRATING ECONOMIC AND LEGAL THOUGHT RELATING TO AGRICULTURAL COOPERATION

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A SEARCH of economic literature reveals that substantial attention has been directed to the inter-dependence of economics and the law. But our attention here is to be directed to a limited phase of economic activity—agricultural cooperation—and the legal considerations related to it. It is a subject to which considerable thought has been given in the past. Even so, the same anomalous situation remains today, though in less degree, that prevailed in 1927 when H. G. Moulton wrote in his preface to E. G. Nourse's book, "The Legal Status of Agricultural Cooperation," that, "The economist has been too little aware of the legal requirements and the lawyer too little versed in the fundamentals of economics and business for either to get an adequate grasp of the issues involved in the organization and operation of cooperatives."¹ Dr. Nourse's analysis of legal and economic inter-relationships in the field of agricultural cooperation, as presented in this book, is the most comprehensive of any to date on the subject.

In my opinion, the position Dr. Moulton expresses is a moderate one. In the not too distant past I had occasion to sit in a meeting of attorneys and accountants at which an economist discussed this matter of relationships between economics, law, and accountancy, and presented some quite advanced theory on the economic role of cooperatives. Judging from the discussion which followed, and from comments of listeners after the meeting, I was convinced there was actual resistance to the "radical" views of the economist. I trust that this is an isolated case not representative of the attitudes of lawyers and accountants generally. It is possible, of course, that more mature contemplation of the new ideas may have put them in a more charitable mood.

L. S. Hulbert² and other legal authorities have given us quite thorough and up-to-date analyses of legislative acts and court decisions which provide legal sanction for the cooperative corpora-

¹ E. G. Nourse, "The Legal Status of Agricultural Cooperation," the Macmillan Company, 1927, p. viii.

² L. S. Hulbert, "Legal Phases of Cooperative Associations," Farm Credit Administration Bul. No. 50, 1942; and subsequent quarterly summaries of cases relating to farmers' cooperative associations from same source.

tion and the cooperative way of carrying on business. There is not available however, for the past two decades, the sort of economic interpretation of these developments as was made by Dr. Nourse in 1927. I trust we can encourage some of our truly advanced students of agricultural cooperation—and they are all too few in number—to provide us with similar careful analyses and interpretations in the light of the many changes and advancements of the past twenty-odd years.

In approaching this subject of integration of economic and legal thought, I wish first to outline briefly the emergence among farmers of the cooperative pattern of business organization and some of the legal implications involved in that development. Cooperative efforts among pioneer American farmers were of the informal type—barn raisings, husking bees, threshing rings, and the like—combining social with economic objectives. There were no legal questions involved—no problems of corporate structure. In the early 1800's however, the fragmentary history of agricultural cooperatives reveals a few examples of cooperative business enterprise—cheese factories in New England, livestock marketing in the Middlewest, and others of like nature. Mutual insurance probably pre-dated all these cooperative marketing efforts.

No information is available regarding the extent to which these early cooperatives resorted to the corporate form of organization. Dr. E. G. Nourse³ holds the view that profit-seeking and cooperative corporations developed side by side, though at somewhat unequal rates of speed and in more or less exclusive fields. He offers the proposition, "that, while the ordinary business corporation was developing such structures and practices as it conceived to be advantageous to itself, elsewhere in our economic fabric other groups of people under other motives and circumstances were fashioning another pattern. Such groups, styling themselves cooperative, were trying to organize a naturally decentralized type of industry for the large-scale operations demanded in a scientific, commercialized, and capitalistic day, while at the same time preserving the personal independence and dynamic element of individual participation and reward which seemed to be threatened under some forms of modern industrialization."⁴

The course of developments which provide legal sanction for

³ *Ibid.*, p. 25.

⁴ *Ibid.*, p. 23.

cooperative corporations and recognize in law their distinctive economic characteristics is no different in essentials than that outlined by H. R. Commons in developing his theory of the going concern. To quote from him: "Meanwhile, there has been growing up, through the decisions of the courts on cases as they arise, the theory of a going concern. . . . The working out of the theory by inclusion and exclusion of transactions that had to be judicated in the decisions of disputes has been necessary in order to do justice to those who had associated themselves together, had built up a business, had assumed responsibilities, had trusted to the credit system, in the hope that their past and present business connection would be permitted to continue in the future. These hopes could not be shattered, else the whole fabric of society would come down. The courts and legislatures find them there, in the customary transactions of individuals, then recognize them, then authorize them, and the authorization is the security of the working rules. New hopes are built on these authorizations, and that which exists in the very nature of Man's transactions with his fellows comes to exist also 'in contemplation of law.'"⁵ In short, emerging organization structures, business practices, and the like which meet the test of economic soundness and social acceptance will in time receive the blessing of legal sanction by legislature or court.

Dr. Nourse reports⁶ that the first stirring of cooperative effort in the early years of the nineteenth century left behind no reminder of itself on the pages of our statute books. This preceded the period of general corporation laws, and cooperatives seeking the corporate form as well as other corporations were chartered by special acts of the legislatures. It is probable, however, that most of these earliest associations operated as unincorporated, voluntary organizations.

By the time of the Civil War, most of the states had enacted general corporation laws. Naturally, the cooperatives organized subsequent to such enactments desired to gain the advantages of the corporate form if they could do so without too great sacrifice of cooperative principles. Various devices were used to fit the cooperative structure to the corporate pattern. For example, in order to assure patron control, inherent in the one-man, one-vote principle, under a statute requiring voting on the regular share basis,

⁵ *Op. cit.*, Commons, pp. 152-153.

⁶ *Op. cit.*, Nourse, p. 29.

limitations were placed on the investment and therefore the voting per patron. Where the general law required distribution of profits according to capital investment, effort was made in many cases to proportion investment in the cooperative to use by each patron. Still another idea—unique in character and a forerunner of the marketing contract which received so much attention from legislatures and courts in the 1920's—was the maintenance (often referred to as penalty) clause in by-laws of Iowa farmers' elevators which pointed up the mutuality of interest of members by requiring contributions on a volume basis toward elevator expenses for grain sales made by members outside their own association.

Most of the early farmers' grain elevators and creameries organized in the Middlewest before the turn of the century and in the first decade of the present century were set up under general corporation laws with some of them adapting the various devices cited above to assure some conformation to cooperative principles and practices. During this period, however, pressure was exerted by farmer and other groups for specific statutes that would authorize incorporation of concerns that were mutual, reciprocal or cooperative in character. A mutual insurance law in New York in 1857, a cooperative association act in Michigan in 1865, and a Massachusetts law in 1866, were among the first. There was little to distinguish these early cooperative statutes from the general corporation laws, but they were indicative of an effort to overcome the lag between economic thought and legislative enactments relating to cooperative organization.

With the passing of time, the weaknesses from the standpoint of sound cooperative practice in the organization of the early farmers' elevators and creameries became more apparent. It was all too easy for such organizations to lose their patron ownership and control and revert to the ordinary corporation form and practices of business operation. In short, there was not at that stage of cooperative development the integration of legal and economic thought such that cooperative principles and practices were properly reflected in legislative acts. Most of the early acts (the California law of 1895 was an exception) provided such slight modification of general corporation laws that they were not conducive to permanency in cooperative organization structures.

The pattern of state cooperative laws passed in the period 1910-20, starting with the Nebraska and Wisconsin Acts of 1911, did a

better job of reflecting the bare essentials of good cooperative practice than had the earlier enabling legislation. Even so, none of these acts reflected the more advanced economic thought of that period relating to cooperatives. Most of them were however—and desirably so—drafted in quite general terms so that they permitted considerable latitude in application of cooperative techniques and experimentation with new ideas. On the other hand, they did not provide a very broad base of statutory rule to assist the courts in the interpretation of points of issue.

The California Act of 1895 is deserving of special comment since it was a radical departure from the cooperative legislation of that period, and reflected cooperative thought quite distinct from that accepted in other parts of the country. And yet it was quite a logical development. Generally speaking, business practices adopted by the grain and dairy cooperatives of the Middlewest held pretty much to the "purchase-and-sale" pattern of other business firms and adhered to going prices. The cooperative device so well known then as the "patronage dividend" was utilized for the distribution of the excess of the margins withheld beyond the amount necessary to cover costs. In contrast, the pooling idea was tried out and attained a high stage of development among California and other West Coast cooperatives. This gave emphasis to more exact proportioning of costs to services rendered and to the mutuality of interest among members. In this latter connection the marketing contract was developed and refined—an excellent example of integration of economic and legal thought. The California law (first the act of 1895 and then that of 1909) brought into the statute books the new idea of personal membership and of the proportioning of capital among members on the basis of volume of business done. Gradually the enabling acts of other states have been amended or new acts passed accepting the non-stock pattern or adapting the proportioning-of-capital idea to the stock form of cooperative organization or both.

Thus far my comment has been directed primarily to the problem over the years of gaining legal sanction for the cooperative form of business enterprise, and for the practices which give it force in accomplished objectives of cooperative endeavor. This has been an evolutionary process whereby ideas are translated into procedures and practices found to be workable, then the move to obtain positive evidence of public acceptance through legislative

enactments rather than to depend upon judicial decisions to gain acceptance. Even so, the body of state and federal legislation relating to cooperatives is complemented by a considerable bulk of judicial decisions. A major problem is the uncertainty which prevails pending legal acceptance of new ideas, practices or procedures, whether gained by legislation or judicial decision. Aside from the enabling legislation, many other legislative acts carry provisions which serve to interpret their application to cooperatives as distinct from other types of business organizations.

The fact that this economic institution—the farmer cooperative—has received legal cognizance, that its distinctive character and practices have been recognized in law and judicial decision, that its right to exist alongside other economic institutions has been established is evidence in itself that there has been reasonable integration of economic and legal thought on the matter. Perhaps the extent of the time lag between the development of new ideas or practices or procedures and their legal and judicial rejection or acceptance provides us with a measure of the degree of integration of thought. In any case, I am sure you will agree that we still fall short of the ultimate in cooperative practice. We are still in the process of seeking the right answers to problems of a changing, dynamic economic institution. Sound integration of economic and legal thought may speed up the evolutionary process and help to come out with timely and correct answers.

Preliminary to setting down some of the specific problems of cooperative organization and methodology presently deserving the attention of students of law and economics, let me outline some of the fundamental concepts of the cooperative from which these problems arise. The first of these fundamentals is the operation-at-cost idea—an idea not confined solely to the cooperative form of organization. A second fundamental concept is that of ownership and control by those utilizing the services of the organization. A third is the concept of capital as a loan fund in contrast to its significance in the profit corporation as the residual claimant of margins in excess of costs of the other factors of production. The emergence of these concepts during the last century or more and their application and refinement in cooperative business practice is in a sense a chronology of the development of economic and legal thought relating to cooperative organization.

The progress of agricultural cooperation to date is in direct pro-

portion to the basic thinking on both theoretical and practical aspects. Richard Pattee, first president of the American Institute of Cooperation, made this statement at the first Institute sessions in Philadelphia in 1925: "We who are managers and directors and you who are professors and scholars should be able to get a more definite, a truer, a more ample understanding of the essential nature of the cooperative form of economic organization. Only with such deeper understanding may this cooperative movement be brought to the more perfect practice we hope to contribute to our country's economic evolution."

Dr. Nourse had occasion to comment on the statement made by Mr. Pattee, which is quoted above in part, at the 1946 sessions of the American Institute of Cooperation.⁷ After pointing out the progress made in 20 years in developing "at least the basic frame of reference for such an understanding of cooperation as an institution," he added this thought: "We must bring the broader and more flexible methods of social science to bear on its solution, not the narrowly limited mechanistic tools of natural science." I trust that social scientists generally will heed the urging of Dr. Nourse and devote time and inquiring spirit to cooperation which he characterizes as "a distinctive economic and social philosophy for the better organization of an important fraction of, and particular functions in, the business of agriculture."

The constantly changing pattern of agricultural cooperation makes it important that continued attention be given to the resulting problems. As cooperatives grow in size and complexity, there arise more than the usual problems of scale associated with bigness. What devices, what procedures need be employed that there may be no serious departure from the fundamental concepts of cooperative economic organization? How bring about operation at cost? How give assurance that control finally rests with those utilizing the services of the organization, avoiding the tendency toward management control so common in proprietary business and industrial concerns? How may member-patron control be exercised intelligently and in the light of adequate information? How about such problems as pooling and pricing which are distinctively cooperative in character?

These and many others are practical problems affecting day-to-day operations and yet of long-term significance. Then there are

⁷ American Cooperation, 1946, p. 9.

the broader problems which concern public policy toward agricultural cooperation. What is its effect on the functioning of our capitalistic economy and the future of American agriculture? What is its place in an agriculture involving price supports and production controls? How do the operations of large-scale cooperatives square with current ideas on monopoly and restraint of trade? Are cooperatives meeting their responsibilities to the general public in a way that is consistent with the corporate privileges granted by statute?

Such problems as these need the thoughtful consideration of economist and lawyer as well as management to assure solutions which will be economically sound, legally acceptable, consistent with good public policy, and yet workable business-wise. It is not enough, of course, for each to analyze and examine as a specialist in his own field. The inquiry must be both within and between the specialized fields in order to assure synthesis of the numerous and often conflicting points of view. By such means, the lag between the development of new and economically sound ideas or procedures in the field of agricultural cooperation and their acceptance by legislature and court will be minimized.

DISCUSSION

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The Hedges and Jensen papers have traced, in an interesting way, the slow growth of the tendency for the courts to differentiate between farmers' cooperatives and combinations of businessmen organized as corporations. I clearly recall my own early contacts with the problem in Ohio during the period 1917 to 1921. I saw zealous district attorneys prosecute the officers of several small fruit and vegetable cooperatives under the Ohio Anti-Trust Act with never a mention of corporate dealers who were doubtless more influential as price makers than were the farmers. At about the same time the officers of a milk producers' bargaining association were called out of bed at midnight and jailed under the same Act, while the powerful corporate dealers were not molested.

Evolution in cooperative structure has come largely by successive minor departures from current practices, much as the automobile of today is the result of many successive innovations. Take, for example, the widely used revolving finance plan. In California, crude plans are said to have developed among some local orange packing associations about 1914 or earlier. During 1917 attorney George E. Farrand developed the plan now used to revolve the capital stock of the Fruit Growers Supply Company in

order to keep its ownership in the associations which used it. At about the same time the California Fruit Exchange, then a capital stock organization, developed an entirely different plan to "revolve" funds originally withheld from earnings to build up supplementary working capital. Gradually, a host of variants of these early plans have found their way into cooperative structures, all of them designed to keep ownership and control of the cooperative in the hands of the active cooperators.

In this process of evolution both the lawyer and the economist have tended to accept the current law and its interpretation as facts to be accepted and have sought to build on them.

Differences in approach or interpretation may very well arise out of training or background. Note how many lawyers or economists tend to reflect the thought patterns of their former teachers. Such influences may well be found to explain some of the "lags" in thinking about cooperatives.

Referring to Robotka's "economic concept of a 'pure' cooperative" Dr. Jensen says its language is "strange to the lawyer, the legislator, and the courts." I share the opinion of Professor Paulson that it is also strange to economists. It is true that the economists' concept of a "business firm" as "a profit maximizing unit" does not fit cooperatives without qualification, but the quoted characterization is likewise not acceptable.

THE FUTURE OF THE GREAT PLAINS REAPPRAISED

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“**T**HE Plains have certainly changed” is an oft repeated phrase as we compare the economic collapse of twelve years ago with the well-being of recent years. The truth is that the Plains have not changed but have merely been demonstrating the extreme variations in production which prevail in an economy geared to a critical climate.

This extraordinary economic zone is located between two great divides. On the west the boundary is well defined by the Rocky Mountain Watershed divide. On the east is a climatic boundary which we have failed to recognize until lately. The climatic divide is of greater importance than the continental divide since it is also the economic boundary. It is here that the ordinary concepts of economics fail under very great strain imposed by critical climate. This divide, according to Thornthwaite, falls on a line which can be drawn about straight south from Fargo, North Dakota. He calls it the zero line which marks the division between the moisture surplus areas and the moisture deficient areas.

About two-thirds of a million farm families live in the zone between these two divides. These families have found that this zone is governed neither by the rules of a consistently humid climate, nor by the rules of a consistently arid climate. The stresses and strains set up under these circumstances are so great that there have been numerous economic breakdowns during the last seventy-five years.

President Roosevelt appointed a committee to study the problems and report on recommendations for this great area as a result of the 1936 drought. In his letter to the chairman he said, “We are anxious that we leave no stone unturned in exploring and reporting on all the possibilities of this region.”

The Committee’s analysis was made under difficult circumstances, as adverse weather had caused a complete breakdown of the economic framework inherited from areas with a reliable climate. Long accepted principles of resource management had worked well on the Plains through the series of favorable years. Suddenly, however, when physical disaster struck, the economic

structure disintegrated. The situation was chaotic, and the Committee's comments were directed to an analysis of badly disrupted conditions and to some remedial lines of action. Great emphasis was placed on what might be phrased, "Keep looking," or "Learn about the laws of Nature." Throughout the report it is recommended that study of the climatic, physical and economic phenomena be stepped up. Very strong localized participation was urged in education and program building. Through the participation of great numbers, the people of the Plains have made marked progress in skillful development of programs. This is perhaps the outstanding feature of the era.

The title of the original inventory and outlook of the Committee report is, *The Future of the Great Plains*. It is a reassuring title, because it declares that the Plains have a future, and it characteristically expresses the philosophy of the Plains that "next year will be a better year." But the recommendations didn't say to wait with folded hands until a turn in the weather bailed out the Plains economy.

Quoting from the Report of the Great Plains Committee: "The problem of the Great Plains offers no simple solution. Yet enough is known about conditions and their causes generally throughout the region, and in detail with respect to certain parts, to permit immediate and vigorous execution of a program of readjustment and development. Further studies of details should proceed simultaneously with the execution of the program, but the beginning of action should not be permitted to await these studies, which should in fact be a part of the program."

The Future of the Great Plains is not a blueprint. It does not claim to be a plan or even a program. It does not set up specific goals to be reached at a given time, but it does say that by the best combination of research, education and concerted action, a suitable way of living can be devised. It does try to appraise the dim outlines of the economic framework into which the programs will have to be built. The President's committee went one step further and said, "The local people must join their efforts in appraising the situation and developing a program." To that end they suggested a Great Plains Council wherein the programs could be crystallized.

The following sentence from the Great Plains Report expresses well the central thesis of the efforts which people have undertaken in this area: "In a sense the Great Plains afford a test of American

ways of dealing with matters of urgent common concern." Throughout a twelve-year history, democratic and concerted effort has met and dealt with a series of urgent problems. The concerted effort has borne results such as I shall refer to later, but never forget that the problems and the remedies were made a common concern of all the people living in the area.

Many of the recommendations of the Committee have been fulfilled, some of them far beyond original expectations. The experience gained in attempting to make improvements has caused economists to probe into underlying principles with which improvement should be aligned. Some features are becoming evident. As yet, they cannot be stated with too much certainty. However, programs may be measured to some degree by whether or not they do some of the following:

1. Provide stability through reserves in as many forms as possible—moisture, feed, seed, money, credit.
2. Provide extraordinary control and protection for resources throughout the cycles of production.
3. Meet the longer than annual intervals between paydays.
4. Give full play to flexibility in cropping plans, repayment of contracts, and even to region-wide expansion and contraction.
5. Maintain the highest possible level of output per man hour to take advantage of peak conditions and low cost per acre or animal unit in order to decrease the rate of dissipation of reserves during periods of stress.
6. Help adjust the community pattern to a sparse population pattern.

We have in the foregoing principles some very obvious conflicts. On the one hand the Plains people as a community and the farm operators as individuals are trying to evolve principles leading toward stabilization, and yet it is held that flexibility is the key-stone for every farm operation and every contract, as well as for the economic structure of the whole Plains. It is a case of being flexible in order to achieve stability.

Management principles for the Great Plains farmer must be such that he can shift quickly and roll with the punch. He can have a central core around which to swing his day to day management but he may have to shift plans rapidly. He must have speed to do jobs when the weather is right. He must be able to build up reserves when the situation is favorable. For instance, he may be planning to cultivate 200 acres of summer fallow. The rules say that he is to complete the first operation by May 15 for best results. However,

when a particular spring season is dry until June 1, he must change his operating schedule so that with the first rain he will be ready to do his first summer fallow operation. He will be wasting \$200 if he does that first operation according to a fixed schedule, and furthermore, he would be exposing his land to wind erosion. Flexibility is the essence of management of other reserves, also, especially livestock feed. A rancher can have a stock pile of three winter's hay supply, but if a drought begins in May and persists on through July, it will be the better part of wisdom to reduce his herd.

The whole economy of the Plains must be able to expand and contract in accordance with the dictates of demand for certain crops. The cropping history of the Plains has a somewhat similar history to that of the cut-over forest lands, where a tremendously big crop is taken off once in two or three generations. In the interim periods, however, there seems to be no satisfactory or systematic set of management principles. In the Great Plains a series of big crops may be taken off the land frequently and therefore the periods of restoring lands and protecting them from deterioration come more frequently, but they are just as hard to handle as are those same tasks in a forest area.

In our appraisal of the future of the Plains, let us examine a few of the adjustments that have been made in the light of those recommended by the committee twelve years ago and try to fit them into this maze of apparently contradictory principles.

1. Moisture conservation is paramount and all practices leading toward this end are an essential part of farm and ranch operation. Several effective practices have been incorporated pretty generally into the routine practices of the farm operator. One of these is stubble mulch. Stubble mulch increases the absorption of water into the soil, which becomes a form of reserve; furthermore, it also protects the surface against wind action. The time required is drastically lowered, giving flexibility to the labor schedule to meet the season's climatic peculiarities.

It is the result of two avenues of research. The farm management experimenter was looking for cheaper fallow operations. The agronomist was looking for an effective device for increasing absorption of rain where it fell. So the two fields of inquiry merged and resulted in a formula which is not only cheaper by \$2.00 an acre, but better.

2. The shortage of water for livestock added to the shock of the

great drought of the early '30's. Water was a limiting factor in some areas rather than grass. Even the movement of livestock to the railway sidings was hampered by the lack of water along the cattle trails. Stock water development was listed by the Committee as one of the "on farm" programs. The original estimate was 20,000 reservoirs. A Plains-wide program of assistance in building stock water reservoirs was developed, and that program combined with the hard work of the ranchers was so effective that 300,000 reservoirs rather than 20,000 were built. Watering facilities are now available within $1\frac{1}{2}$ miles of most all grazing resources, and the reserve water supply is likely to hold out as long as the grass supply. The costs can be charged partly to insurance and partly to increased plant efficiency.

3. Dust storms and spectacular wind erosion appeared on every side during the 1930's; therefore, extraordinary emphasis was given to protection from blowing soil and the ways and means of restoring lands to permanent cover. In the course of eight years, 10,000,000 acres of wheat land have been restored to permanent grass. The restoration measure is not only one which applies farm by farm, but has community implications, inasmuch as a shift from more intensive wheat production to the more extensive grass production requires a drastic change in the size of the farm unit, and therefore every farm bursts out at the fences.

It is a protective measure, but its flexibility operates on a tremendously broad scope and has a one-way aspect about it. When the situation dictates a shift to wheat production, the change comes rapidly. The possibilities for returns are immediate. Manpower and equipment can be moved in readily. The larger ranch units can be broken into smaller wheat farms with the mere signing of a purchase contract (and at a good profit to the vendor). The grass lands can become wheat lands almost overnight. One county has increased its wheat acreage one hundredfold during the last eight years; mostly in the last four years.

When the economic and climatic situation calls for returning 10,000,000 to 20,000,000 acres to grazing use, it takes years to get a stand of grass and go through all the farm reorganization which accompanies this shift. It is costly and seems to require public assistance and certainly requires an outlay on the part of individuals from which they cannot hope to profit immediately.

The restoration of millions of lower producing acres of wheat

lands was a gigantic task well accomplished. But the Plains people are still in the process of learning the requirements which underlie flexibility on a grand scale. The community organization which accompanied the process of restoring land to grass was facilitated by the drawing off of manpower to the war industries. A study by Ward and Green entitled, *Geographical Differences in Production from Agricultural Land in the Northern Plains*, shows that by 1944 on a county by county basis a fairly uniform balance had been struck between the resources and the numbers of population. In the second round of restoration which is now before us, some of the factors which caused people to move to industrial areas will not be present, and therefore the balance will come less readily.

The accepted concept of marginality goes to pieces under the circumstances of a critically variable climate. Which acres are submarginal, those in central Kansas which produced an average of eight bushels during one ten year period, or those in western Kansas which produced an average of sixteen bushels in the ten year period immediately following? It is clear that we cannot use short time productivity records to determine submarginality. The determinations will be made on long time yield history and on the degree to which some soils are sensitive to wind action or water erosion. As these factors become established and accepted by resource managers of the area, then the adjustments to a particular type of production will be more permanent.

4. Utilization of water resources has advanced at a rapid rate, as the original appraisers of the future had hoped. Their emphasis was on small farm-by-farm irrigation. Records show that more than a million acres of crop land and meadow land have been put under irrigation in twelve years by the use of these small systems and it has been very largely of the type which added to the winter feed production of the ranch, or of the type which provided for the bridging of within-season droughts, as in the case of the pump irrigators of central Nebraska.

Irrigation systems both large and small must undergo a process of being adapted to a sub-humid climate if they are to give full results. First, they must be designed to give insurance against the effects of intermittent drought. Second, irrigation production must be fitted into an existing agricultural pattern. Third, the availability of water must be flexible.

Eight pilot projects which were established nine years ago to test

the usefulness of small irrigation projects of ten to twelve thousand-acre size scattered throughout the Great Plains embody the principle of an efficient design for farms which is comparable to the design for dams for safe and efficient water impoundment. Other principles, such as repayment according to productivity, and in some cases variable repayments, are being tried out. The integration of these projects into a surrounding agriculture has not been adequately tested as yet.

No mention is made in the Committee report of the gigantic water impoundments along the main streams of the Great Plains. However, in the course of fifteen years, engineering techniques have advanced to a point where one of the rivers of the Plains, the Missouri, will have a series of great water impounding structures. The experience in building earth dams derived from constructing the Fort Peck Dam, completed in the late '30's, has no doubt given impetus to additional great structures on the Missouri River. Large water-holding structures will no doubt be devised for other main streams as well.

5. Great stress has been placed on feed and seed reserves. The practice has been easy during these lush years; however, the original concept of feed reserves has undergone considerable revision. The cost of feed and the storage of feed should be balanced against the cost of maintaining a flexible livestock herd. The point of balance is still unknown.

It is being recognized more and more that a system of feed reserves is far more inclusive than having an extra stack of hay on each farm. Effective feed reserves cut clear across the board from the management of the open range, through winter grazing, through hay supplies, to well distributed stocks of grains, and in a larger sense includes the production of feed on irrigation projects.

There was some experience with stockpiles of grain during the late '30's and early '40's, when great supplies were under government storage. The distribution of these stocks did not conform to what the requirements would have been in case drought had come to any one community. Neither were the means devised whereby grains could be put in storage on a loan basis which would enable them to be withdrawn for feed purposes when and if needed.

We have also had some experience in efficient integration between production of hay on irrigation land and its use by the up-land rancher. When conditions are favorable, the feed stocks of an

entire area are high. The irrigation farmer finds that the sale value of hay is extremely low. When the entire area is short of feed, the prices will be high, and the cost to the rancher is sometimes excessive, but the irrigation farmer has no more than one year's surplus production to sell at those advantageous prices.

6. Land ownership, or at least systematic control of lands, was the point of greatest concern with those who studied the prospects of the Plains in the middle '30's. The whole system of ownership seemed to have broken loose. In fact, Dr. H. H. Finnell says that much land became a dust bowl hazard because of lack of finances and lack of continuing management of land.

The years of prosperity have obliterated the weaknesses which caused 30 to 50 million acres of land to go out of systematic management during the drought period. It appears, however, that some of the land tenure measures which have been introduced will be effective in keeping land under some sort of management under extremely adverse conditions. For instance, there are about 5,000 farms in the Plains area which have been put in the hands of farm operators under a variable repayment contract. Also most loan companies have introduced the principle of forbearance. Not all of the mortgage contracts have this provision clearly stated. In case of widespread income failure, some of the confusion of the '30's might be repeated.

Partial ownership has come to be important in many areas. By means of partial ownership, the operator shifts some of the fixed cost to a second person. In some cases the second person is the government or some other organization which can forego returns from the land for indefinite periods, providing that the average is maintained through higher returns during favorable seasons. A methodology in the protection of equity, security of occupancy, and continuity of management is slowly coming to undergrid the Great Plains economy.

7. Institutional devices for protecting and managing resources are discussed at length in *The Future of the Great Plains*, for it looked as if individual managers were unable to cope with problems which were so widespread. The suggested devices include zoning and two new instruments, a district for the control of erosion and the grazing association.

Zoning embodies many of the principles which are required in a Great Plains instrument for control. However, it lacks the feature of flexibility.

Grazing associations have their application in areas which are quite obviously and permanently given over to range use. The grazing association provides for flexibility in that it envisages rapid changes of livestock numbers to coincide with the seasonal forage production. Flexibility in annual rental fees through the use of the cow-month basis is spreading.

The districts "for wind erosion control," such as were enacted in Texas, have been superseded by the conservation districts. Some of the state conservation district laws do provide for some ordinances which will encourage or discourage certain trends in land use. When a conservation district through experience evolves control devices, the district can become the medium for a systematic shift in land use that will no doubt some day include the measures which will enable manpower to come into an area and quickly convert it to wheat, but with certain protective restraints. These districts can also provide for a reserve fund, or measures which will quickly restore the grass cover on certain lands. If such measures are eventually devised, community disorganization will not be as great as it is at present.

8. Adaptation of public and private facilities to a sparse population pattern with its attendant small trading center, is perhaps the area of least progress. We have just lately begun to recognize that sparse population is a permanent and modifying characteristic of the Plains, and that the entire system of public and private services must gradually, even though painfully, adjust. Some of the states have initiated laws providing for redistricting of schools, but so far the implementation of these laws has met largely with failure.

I have recited a few instances where the economic strength of the Plains has increased through programs of improvement, but let me refer you again to that key sentence in the President's Plains Committee Report: "In a sense the Great Plains afford a test of American ways of dealing with matters of urgent common concern."

The Plains people have learned much about methodology of practical interpretation and concerted approach. The confidence of the future lies as much in the practical interpretation and concerted approach as it does in having found excellently adapted practices and in having seen major programs put into effect. It is for this reason that I want to give the five stages which seem to be essential to full cooperation in "dealing with matters of common concern."

1. Each of the problems to be attacked must be isolated so that the people may see specifically what its components are and what its effects are, so that it will be a clear-cut and manageable segment in the program of modification.
2. The remedy as well as the problem must be thoroughly understood by thousands of people. Such understanding results from a thorough-going discussion where farmers themselves work out the means for initiating the remedial measures.
3. The remedial measures must be tested as far as possible by the criteria of the area.
4. An inventory must be taken of the facilities at hand for doing the job. Many times the job involves public as well as individual interests and this point must be recognized by law or by the administrative adaptation of a program.
5. Concerted action must be obtained between the agencies that are concerned with assisting farmers in the process of adjustment and modification.

One may say that the foregoing stages are ways and means to overcome at least four major hurdles:

1. Individual adaptation, whereby managers of the resources set aside methodologies which have been imported from other areas or carried over from earlier years.
2. Institutional adaptations, which in many ways are harder to evolve than individual adaptations, because they require group action, changes in laws, etc.
3. National cognizance of the problem must be obtained, since all agricultural production has national implications.
4. Organizational geography tends to shape up according to convenience of travel and grouping of adjacent states. Ofttimes centers of problems are not only cut in two but into several pieces, so that they become incidental and fringe problems to groups which are considering studies of problems, educational means, or action.

In the re-appraisal of the future of the Plains, one must recognize that progress is being evaluated in terms of principles and measuring sticks which have not been fully crystallized, and also, that the tests must come over a long period of time, for what seems like progress in one era may prove to be just another weak link in the one following.

There are those who believe that the economy of the Plains could withstand the strain of a drought of the intensity of the '30's. That conclusion is by no means supported by the evidence. There are also those who maintain that it is impossible to devise enough adaptations in the physical field or to adjust our management con-

cepts to a point where the economy will be anything but a continual repetition of "boom or bust." However, the evidence is here to indicate that the economic structure is less likely to go to pieces under severe strain than it was when the area entered into the great drought of the '30's. We must remember that the Plains economy is subject not only to great droughts affecting the whole area, but to localized droughts which are in effect in some part of the Plains most every year, and the economic structure may be strengthened so that at least it could cushion minor droughts.

The Plains people have become less and less a "next year" people. They are recognizing that they are resource managers who must figure in terms of a long time performance. They can see by the statistics that if they can live in the Plains for twenty or thirty years, they will have a better than the national average income. So they are devising every means and using every skill that science and experience can produce in order to manage their resources and finances in such a way that they can maintain a high level of living and yet protect their resources.

DISCUSSION

R. B. TOOTELL

Montana Extension Service

Mr. Starch mentions frequently the word "flexibility." Probably in no other part of the country is flexibility in farm organization and operation as essential to the achievement of *stability* as in this vast semi-arid country known as the Great Plains

Particularly in the early part of his paper, it seems to me that Mr. Starch is too optimistic. For instance he says, "The Plains people are no longer 'next year' people." I doubt if this can be very adequately demonstrated until the next series of drouth years. The Plains people, are, as Mr. Starch points out, becoming more in the nature of "resource managers." However, it seems to me he infers they have achieved a higher degree of accomplishment in this direction than I am presently willing to concede.

I quite agree that if the people of the Plains can live here for a 20 or 30 year period they will, over that period, have incomes averaging higher than the national average. A real problem of Great Plains farmers and ranchers is, therefore, how to weather the lean years *in a satisfactory manner*, in order to take advantage of the high income periods.

Reserves in the form of moisture, feed, seed and capital accumulated during good years is undoubtedly the key to weathering the adverse periods. I am inclined to place greater emphasis on capital reserves and less on the others than Mr. Starch. At the same time I should like to point out

that the high income tax rates of recent years seriously impair this safety factor. The "net after taxes" is not going to permit "averaging out income" as we formerly attempted to do. Cash or readily convertible securities are important, but other types of capital reserves are equally important. Debt free ownership of the farm or at least a modest debt is one of the best reserves possible.

This matter of reserves leads logically to crop insurance. Farmers in no other part of the country stand to profit as much over the long pull from crop insurance as do those operating under the highly variable conditions of the Plains.

For many years there has been a trend among western ranchers toward a cow and calf type of operation. It is too inflexible. When a dry year with little forage production occurs the operator may have to dispose of a high percentage of his breeding herd and he is not in good position to expand when feed supplies become more abundant. A cow-steer type of operation gives far more flexibility. With the advent of very favorable grass years the steer operation permits rather rapid expansion.

Because there has been a considerable expansion of the cow and calf type operation we may expect a relatively heavy reduction of livestock numbers when drouth conditions return. Encouraging a return to a higher percentage of steers before drouth comes will be in the interest of operators on those ranches now following the cow and calf system.

Mr. Starch has indicated that considerable land use adjustment is necessary. Some of the obstacles that stand in the way of this adjustment are:

1. Under present conditions of favorable moisture and prices, farmers are not voluntarily going to give up the prospective income as a contribution to the cause of conservation.
2. The land is capitalized on too high a basis.
3. There is an acute shortage of grass and legume seed of adapted varieties.
4. Real estate taxes usually lag years behind any adjustment in land use.

There have been nine years in most parts of the Plains during which dissatisfied farmers and ranchers could sell to advantage. Because of the alternative opportunities prevailing, practically all of those on the land now are here by choice. They like the Plains and more than ever before they are spending money to improve their homes and make them permanent. The rugged conditions of the '30's constituted the most severe kind of test. For the most part there has been a "survival of the fittest." The future of the Great Plains rests primarily with the people themselves. They still have many adjustments to make. I personally believe it improbable that a drouth as serious as that of the '30's will occur again during my lifetime. I believe it even less probable that severe drouths of the future will be accompanied by the disastrously low prices of the great depression. The Plains already has experienced the worst! It is now far better prepared to meet future emergencies.

DISCUSSION

GEORGE MONTGOMERY

Kansas State College

The paper presented by Mr. Starch outlined effectively two of the basic economic problems of the Great Plains: the systematic control of resources throughout the productivity cycle and the development of social and political institutions in an area of sparse population. Toward the solution of problems of production and efficient use of resources from the individual's viewpoint, substantial progress has been made. In devising effective social control of resources throughout the cycle, the record of accomplishment is not as good. Soil conservation, grazing programs, control of wind erosion, and flood control, indicate progress in protecting society's interest in the resources of the Plains. But much remains to be accomplished. The recent war period, accompanied by good yields and high prices, encouraged the use of land for immediate gain of individuals without adequate regard for the maladjustments which may follow.

It has been pointed out that, "Plains people are no longer a 'next year' people. They are becoming resource managers who figure in terms of a long-time average." This is true, but they still figure in terms of a long-time average that will provide the largest individual income. Adequate consideration is seldom given to the social problems arising from the actions of individuals. The income obtained from wheat during the years of high yield and high prices was probably many times the income to be expected from grazing, and the annual net income may have been larger than the current market price of the land. Unfortunately, this maximization of individual income has not contributed to the stability of the agriculture of the region. We are now faced with the problem of shifting these extra acres from wheat back to grass in order to prevent reappearance of the specter of the dust bowl.

The problems of physical production in the Plains area were solved effectively under a system where the motivating force was private gain. The traditional independence of the pioneer, and the necessity for speculative gains as a reward for enduring the hardships of the frontier created throughout the Plains a philosophy of individual freedom in the use of land. The emphasis upon the independence of the individual in the right to use land as he chose, and the economic and political institutions created in the pioneer days have not provided a favorable framework for solution of problems of wind and soil erosion, problems of surpluses and fluctuating prices, and instability resulting from high natural risks. In the past much of the research in the Great Plains has been directed toward improving the efficiency of the individual and increasing personal incomes. With the fluctuations in yields, prices, and incomes, which characterize the Plains, society cannot afford to rely primarily on the self-interest of individuals to provide answers to problems relating to efficient use of resources and stability of income. The task ahead is one of developing techniques or organi-

zations for effective group action. Land-use classification and zoning are techniques which might be utilized to prevent excessive expansion of wheat acreage in periods of high yield and high prices. The soil conservation district, the grazing district, the irrigation district, are examples of group organization adapted to area and regional problems. Reliance upon group organization and local leadership should provide a more stable and efficient agriculture than can be achieved by monetary payments

The paper providing the basis for this discussion refers to the "adaptation of public facilities to a sparse population as the weakest link." It is not only the weakest link, it is the one to which the least attention has been given. There has been a decrease in farm population in the fifteen years since "The Future of the Plains" was first considered. There has been a substantial migration from farms to the county seats and village communities. Apparently no one knows the actual extent of this migration in areas such as Western Kansas. Likewise little is known about the reasons for this movement, or to what extent the farm family has improved its lot by moving to the county seat or village. There has been concern about wind and soil erosion, but little attention has been given to problems arising from the movement of farm families. Inadequate appraisal has been made of the impacts of these movements on the schools, churches, and other social economic and political institutions. Relatively little is known about how the movement of the family to town will affect the size, organization and efficiency of the farm. Will it mean complete abandonment of livestock and poultry enterprises on those farms where the family resides in town? How will this migration affect the educational programs of 4-H Clubs and vocational agriculture? Substantially more information is needed on these trends which have such an important bearing on the future of the Great Plains.

FARM BUSINESS SURVIVAL UNDER EXTREME WEATHER RISKS¹

RAINER SCHICKELE
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THE vulnerability of farm income to fluctuations in business activity and prices is notorious. In high weather-risk areas, the effects of extreme variability of weather are super-imposed upon the uncertainties and erratic performances of our national economy. The Great Plains are such a high-risk farming area par excellence, and I shall draw some illustrative material from that area.

John Wesley Powell, in his famous "Report on the Lands of the Arid Region of the United States" (1878), warned against the folly of allowing this area to be homesteaded. He visualized the settlement of most of the Plains in "pasturage farms" of not less than 2,560 acres in size. He considered irrigation the only dependable basis for arable farming in this area.²

During the succession of ten drought and pest years in the '30's Major Powell's report was brought to light again. People began to wonder; perhaps this settlement of the Great Plains was really all a big mistake. Then, during the '40's, years of exceptionally good weather and prices have given Great Plains farmers an unprecedented prosperity. Many debts have been paid off, farms enlarged, houses modernized. Yet, farmers ask themselves: How long will it last? Could we survive another drought like the '30's?

Such a long and severe drought might not recur again during this century; or it might start next year. It might be even longer and more severe; or it might be shorter and less devastating. Or the weather might, for a spell of years, hover more closely around some long-time average. Who knows?

Fundamentally, with respect to the time dimension relevant to planning and decision-making by individuals and groups, the weather factor in this region represents an uncertainty of a kind that seems to preclude actuarial determination of annual budgetable costs

¹ Abstract of a paper presented at the Annual Meeting of the American Farm Economic Association, Laramie, Wyo., Aug. 19, 1949. The full text may be obtained from the author upon request. Journal paper of the North Dakota Agricultural Experiment Station, Project P143

² 45th Congress, 2d Session, House of Representatives, Ex. Doc. No. 73, April 3, 1878, p. 22.

of *weather risks*. This may mean that a "sound" crop insurance program with premiums balancing indemnities over a *reasonable* time span (which could hardly exceed 15 years or so) might prove impossible; that the utmost thrift of individuals during good years would yield reserves insufficient to tide the farm business and family over long years of crop failures; that the nation might have to come to the rescue of Great Plains agriculture once or twice during a generation; and that if we fail to adapt our economic institutions to the weather uncertainty, we might fail to preserve dry-land farming in the Plains—or preserve it at a staggering social and human cost.³

Problem I: The Bunching of Poor and Good Years

The yield variability itself, high as it is, does not constitute the core of the economic problem. It is the bunching of poor and good years into long periods and their universal incidence that taxes the farm economy of the Plains. Let me illustrate.

In North Dakota, wheat yields averaged 11.8 bus. for the 13 year period of 1933–45. During the first five consecutive years, wheat yields were more than 30 percent *below* that average (<8.3 bus.); during the last five years, they were more than 30 percent *above* the average (>15.3 bus.), and only during the three years in the middle did they fall within 30 percent of the average—a very wide range at that, compared with yield variabilities of major crops in other farming regions.⁴ Every year since 1941 (i.e. eight years) wheat yields have been 20 percent or more *above* the 25 year average of 11.9 for North Dakota.⁵

If these wide yield fluctuations were fairly well dispersed over time so that poor and good years would tend to alternate, the economic problems of income instability would be greatly eased. People could then build up sufficient reserves in cash and kind during one or two good years to tide them over one or two poor ones. Premium rates for crop insurance would be much more amenable to

³ For the sake of simplicity of exposition, I assume that most of the present dry-farming area should remain in farming for optimum resource allocation.

⁴ During the same period corn yields in Iowa fell below 30 percent of the average in only two years, and exceeded 30 percent of the average in none of these years.

⁵ Over a 530 year period in North Dakota tree-ring studies suggest that there were 22 dry periods and 24 wet periods of three or more years, and only five dry and five wet periods of one or two years. The longest dry spell was 16 years (1782–1801), the longest wet spell was 39 years (1664–1702). See G. F. Will, *Tree Ring Studies in North Dakota*, *N. D. Agr. Exp. Sta. Bul.* 358, April, 1946, p. 23.

actuarial determination so that for any 10 or 15 year period indemnities could be made to balance premiums. An ever-normal granary program could be operated at less cost.

As it is, the cumulative economic effect of the bunching of good and poor years into periods of irregular length is highly disturbing to the planning of farmers and agencies. It results in widely dispersed probabilities of yield expectations and high individual and social costs incident to that uncertainty, in the form of bankruptcies and human despair or sporadic relief action from outside the region.

Therefore, one of our chief problems is to minimize this cost of uncertainty, to cushion the impact of a series of poor years upon the farm economy, and to build all kinds of "reservoirs" for catching as much as possible of the "rainfall profits" of good years.

The geographic incidence of poor crop years tends to be nearly universal throughout the region (in contrast to the incidence of hail, frost, fire or life losses for instance). This results in: (a) The difficulty of spreading the total annual cost of yield risk among the producers in a locality or even the region and expecting them to be able to carry such cost through the whole sequence of poor years; and (b) the need for carrying extremely large reserves of physical stocks and liquid assets, because the majority of Plains farmers will depend upon such reserves *all at the same time*. Just imagine what the size of the reserves of a fire insurance company would have to be if at irregular intervals 80 or 90 percent of all the insured houses would burn down simultaneously.

The bunching of the poor years and their universal and simultaneous incidence throughout the region suggest that it might be cheaper and more feasible to allocate part of the risk cost outside the region rather than make the region carry it all.

Problem II: The Critical Limits of Survival

The economic problems created by yield fluctuations and the bunching of poor and good years are aggravated by the structure of the farm business. Most farms are of the family type, varying in size roughly between one-half and two sections in grain areas, or 50 and 200 cows in grazing areas. The bulk of the labor force comes from the operator and his family and constitutes a fixed cost in the enterprise.

Rigidity of operating and living costs: If in a succession of poor

years net income available to the farm family is reduced below the minimum living requirements, the survival of the farm as a going concern and as a family home is threatened. Hence, it is not enough to consider only the amplitude of income fluctuation. Even more important are frequency and extent of income deficits below the level of minimum operating and living requirements of the farmer.⁶

For instance, if the net income is \$10,000, a poor crop slashing that income to one-third does not endanger the survival of that farm family; but if it is \$3,000, an income reduction to one-third—particularly if prolonged over several years—will wipe out farm and family. Plains' farmers have often been called gamblers; but gamblers rarely play for their homes as stakes.

The crucial problem of weather uncertainty for the farmer is to reduce the probability that crop hazards will cut his income below the critical limit of survival. To illustrate, let us construct a model of a typical wheat farm in the Northern Plains.

In this simple model, the effects of output variations due to weather from 67 to 125 percent of a long-time "normal" upon the disposable cash farm income are demonstrated.⁷ Such variation in output has but little influence on input costs; hence, they are held constant. An *unencumbered owner-operator* of average ability and with a family requiring about \$2,400 of living expenses to maintain a minimum adequate standard can just squeeze by on a two-thirds crop; a *moderately encumbered owner*, under present rigid debt and tax obligations, falls 30 percent below the critical family maintenance level—which he might manage for one year by postponing replacement of clothes and other temporary retrenchments in consumption expenditures, but which over a period of years will inevitably result in loss of the farm; a *heavily encumbered owner* can just squeeze by on a "normal" crop, but is completely at the mercy of his creditors in case of a two-thirds crop.

It is the *location of this critical limit of family maintenance* and the *reduction of the probability that a farmer's disposable income might fall below this limit*, which constitutes the heart of the income stabilization problem in the Great Plains.

⁶ We consider here the price level to remain constant.

⁷ Note how the relatively fixed cost structure affects the "net operator's income elasticity with respect to yield." A 30 percent reduction in yield (from normal) results in a 50 percent reduction in net income for an unencumbered owner, 60 percent for a moderately encumbered owner, 90 percent for a heavily encumbered owner—using rounded figures. The implication of this relationship is not sufficiently realized by economists who are developing the marginal analysis of production functions.

TABLE 1. TYPICAL NORTHERN PLAINS WHEAT FARM^a
(Assuming 1946-47 price level)

Item	Unit	"Good" Conditions	"Normal" Conditions	"Poor" Conditions
Wheat yield per acre	Acres	480	480	480
Cash receipts	bu.	14 8	11.8	8.0
Cash operating expenses	\$	8,700	6,900	4,600
Property taxes, insurance	\$	1,700	1,700	1,700
Net Cash farm income	\$	300	300	300
	\$	6,700	4,900	2,600
A. Unencumbered Owner				
Disposable Cash income	\$	6,700	4,900	2,600
B. Moderately Encumbered Owner				
Debt payments on 5% ten-yr. mortgage of \$7,200	\$	900	900	900
Disposable Cash Income	\$	5,800	4,000	1,700
C. Heavily Encumbered Owner				
Debt payments on 5% ten-yr. mortgage of \$10,000; 6% short-term loans of \$2,000 over two years	\$	2,310	2,310	2,310
Disposable Cash Income	\$	4,390	2,590	290
Minimum Requirement for Adequate Family Living Standard ^b	\$	2,400	2,400	2,400

^a Adapted from W. D. Goodsell et al, *Typical Family-Operated Farms, 1930-47*, B.A.E.F.M. 55 and 70, U.S.D.A., Washington, D. C., April 1946 and Sept. 1948.—This is a 480 acre farm, with a real estate investment of \$12,000, and machinery and livestock investment of \$4,500.

^b For a city worker's family of four, the estimated costs of a minimum adequate family budget was around \$3,200 at June 1947 prices (See U. S. Dept. of Labor, B.L.S. Bul. 927, *Workers' Budgets in the United States*, March 1948, p. 22.) For a typical farm family of five or six a budget of \$2,400, or 75 percent of a city family of four, might be expected to provide a roughly comparable level of living.

This proposition needs emphasizing. The problem is *not* to stabilize income near a long-time "normal" level. It is rather to *prevent the disposable income of any competent and honest farmer from falling below the critical level of farm and family maintenance* as a result of weather and price factors beyond his control. *Any income variation above this critical limit, however wide and erratic, does not seriously jeopardize the region's farm economy.*

Character of Income Variability: To get a sense of the character of income variability, take North Dakota as an example. *In terms of 1947 dollars*, gross cash income from marketings per farm averaged \$4,600 for the 25 year period of 1924-48, and ranged from \$1,380

in 1932 to \$10,240 in 1947,⁸ or from 30 to 220 percent of the average (see Table 2). All years with a gross cash income 33 percent or more below average were consecutive, lasting 10 years.⁹

TABLE 2. FREQUENCY AND LENGTH OF VARIATIONS IN GROSS CASH INCOME PER FARM, IN 1947 DOLLARS, NORTH DAKOTA, 1924-1948, 25 YEAR PERIOD

Range Limits		Number of Years	Percent of all Years	Length of Consecutive Years
In Percent of Average	In 1947 Dollars			
Under 50%	2,300	8	32	8
Under 67%	3,100	10	40	10
Under 80%	3,700	12	48	11
80-120%	4,600 average	6	24	2, 3, 1
Over 120%	5,500	7	28	7
Over 133%	6,100	7	28	7
Over 150%	6,800	6	24	6

What does this mean in terms of the critical limit of farm business and family survival? These figures represent gross cash incomes from marketings out of which all operating and living expenses as well as debt and tax payments had to come. State averages are notoriously inadequate to answer this question satisfactorily. We hope soon to get income distribution estimates which should throw considerable light on this problem of critical limits. In the meanwhile, we might get a very rough idea from the material at hand.

Under a parity ratio of around 95, and under "normal" crop conditions, we can assume that something like one third of the cash receipts from marketings is required to meet current operating expenses and taxes on the majority of North Dakota farms. The parity ratio for the 25 year period was 94. Let us assume that on the average about \$1,500 was required from the \$4,600 to cover these expenses, leaving an average disposable income (except for income tax) of \$3,100 to an *unencumbered owner-operator*. If necessary consumer expenditures for a typical farm family required \$2,400 (in terms of 1947 prices), \$700 would have been available on the average for savings and improved living.

⁸ Based on data from "The Farm Income Situation," B.A.E., U.S.D.A. Cash receipts are divided by the U. S. "Prices Paid" Index, 1947=100.

⁹ The variability of *net* income is, of course, much greater than of gross income. See "Risk-Bearing in Agricultural Production in the Great Plains—Based on a Study of 246 Kansas Wheat Farms," B.A.E., U.S.D.A., July 1949. (mimeo.)

The crucial question now is: In how many years and how far did the disposable income fall below the critical limit of family maintenance for unencumbered and encumbered owners? In 13 out of the 25 years, an *unencumbered owner-operator* with a period average of around \$4,600 gross cash income could not have maintained family living expenditures at \$2,400. A *moderately encumbered owner* could not have maintained that living level and an annual debt payment of \$900 in 16 years of that period, of which 15 were consecutive. He would have had a *negative* disposable income in eight consecutive years (1931-38). It is estimated that around one third of all North Dakota farmers lost their farms through foreclosure during the '30's, largely as a result of these conditions.¹⁰ Most farmers were forced to reduce operating and living expenses way below requirements for efficient production and minimum adequacy in family living—to the detriment not only of themselves, but of community welfare and the land as well.

The cumulative effect of the bunching of poor and good years is demonstrated in Table 3. An *unencumbered owner-operator* of an average size farm who started farming in 1924 would under the assumed conditions have entered the '30's with a saving of \$2,100 (of 1947 purchasing power). During the next 11 years, he would have had to go into debt for \$17,500. From 1941 on, had he kept his expenses at the \$3,900 level he would have saved by 1945 more than sufficient (\$17,900) to repay the incurred debt, and would have wound up by 1948 with a net saving over the 25 year period of \$17,350. For an *encumbered owner*, the last 25 years would have wound up with a net deficit of \$5,100 in 1948. In order to maintain the assumed expenditure level, he would have had to borrow between 1926 and 1940 \$32,800—a sum quite beyond his reach. Still, his deficit of \$5,100 might be wiped out by two or three more good years so that he might get into the clear over a 25 to 30 year period. Then, again he might not. This is much too long a time-span for an individual farmer to plan his finances. There can never be any certainty that the deficits will be offset by surpluses within any predetermined time period relevant to individual planning and decision making. The implications of these characteristics of income variability are far reaching.¹¹

¹⁰ See Schickele and Engelking, *Land Values and the Land Market in North Dakota*, *N. D. Agr. Exp. Sta. Bul.* 353, June, 1949.

¹¹ See also Carl P. Heisig, *Income Stability in High-Risk Farming Areas*, this *Journal*, No. 1946, pp 961-972.

TABLE 3. EXCESS OR DEFICIT OF DISPOSABLE FARM INCOME (IN 1947 DOLLARS).
IF AN ANNUAL FAMILY LIVING COST OF \$2,400 HAD
BEEN MAINTAINED, NORTH DAKOTA, 1924-48^a

Period	Excess or Deficit of Disposable Income			
	Unencumbered Owner		Encumbered Owner	
	Excess	Deficit	Excess	Deficit
1924-29	\$ 2,449	\$ 348	\$ 221	\$ 3,520
1930-40	—	19,615	—	29,515
1941-48	34,868	—	27,868	—
1924-48	37,317	19,963	27,889	33,035
Net	+17,354			- 5,146

^a "Disposable" income except for income taxes.

The Goal

These characteristics of weather uncertainty and yield variations, in conjunction with price uncertainty and the closeness of the long-time average income level per farm to the critical limits of business and family survival, suggest the following over-all goal for remedial measures to stabilize the farm economy in high-risk areas:

We must find ways, through a combination of individual practices and public policies, that will enable any competent and honest farmer operating an adequate-size unit to ride out periods of drought and very low incomes without starving his family, robbing his soil and losing his farm.

We must discover and apply new farm management and business practices, cooperative methods and government programs that will provide an adequate minimum of economic security over the years for any farm family willing and able to do its share, in face of extreme weather and price hazards.

More specifically: *when, due to no fault of the farmer, his product value falls below the critical limit of necessary farm operation and family maintenance, he should have an opportunity to draw upon sufficient resources from within or outside his enterprise to maintain a minimum adequate level of expenditures.*

As much of those resources as possible should come from *within* his farm unit, from reserves and insurance premiums that he can reasonably be expected to build up and maintain economically on his own. Beyond this source, additional stocks and funds will be needed by many farmers during one or more periods in their active years which will have to come from *outside* their enterprise, in the

form of crop insurance indemnities, credit of various kinds including debt and tax deferments, and in extreme emergencies even public grants in aid (of which price supports represent one kind).

From the viewpoint of resource allocation, the disruption of an adequate-size farm as a going concern under average management due to weather hazards entails a social loss; from the viewpoint of personal income distribution, the disruption of a competent and honest farm family through prolonged deprivation and eventual dispossession as a result of weather hazards spells undeserved hardship and drags a long train of social costs, unrest and frustration in its wake.

The goal is not primarily to reduce yield uncertainty, but to reduce the impact of yield uncertainty upon the security of the farm economy. The goal is not to stabilize income at some long-time average level, but to place a floor at the critical level of farm and family survival. The goal is not to depopulate the high-risk areas down to the Indian level of man-land ratio, but to secure a pattern of farm sizes where each unit is large enough to apply modern production technology and to support a family at acceptable standards of living *under conditions of long-time average yields*.

Remedial Measures

Crop Insurance: The first question might well be, whether the physical yield uncertainties can be converted to "known risks." Frank H. Knight points out: "when the technique of business organization has reached a fairly high state of development, a known degree of uncertainty is practically no uncertainty at all, for such risks will be borne in groups large enough to reduce the uncertainty to substantially negligible proportions."¹² He distinguishes between three different types of probability judgments: "a priori probability" as exemplified by throwing a perfect die; "statistical probability" determined by mass observation and classification of instances in frequency distributions, e.g. fire hazard for buildings; and "estimated probability" derived largely from our intellectual capacity "to form more or less correct judgments about things," from "an intuitive sense of value," such as the estimated probabilities of various relevant events upon which an entrepreneur bases his business decisions.¹³ Only the first two types of probability

¹² F. H. Knight, *Risk, Uncertainty and Profit*, p. 47.

¹³ *Ibid*, p. 225.

can be expressed in terms of actuarial valuation of risks. Certain specific meteorological components of the factors determining crop yields could conceivably be evaluated in terms of "statistical probability."¹⁴

It has been estimated that fairly accurate yield histories over a 25-30 year period would be required in order to establish premium rates which would approximately balance indemnities over such a period.¹⁵ The principles involved here may well have much broader socio-economic significance. The unevaluated *total* uncertainty of a given type of occurrences (in this case wheat yields) is broken down into two parts: (1) one part represents a valuated risk determined by limited statistical observations of certain occurrences (e.g. yield deficiencies) over a relatively short period (e.g. 10-20 years)—the cost of this "*partial risk*" being borne by the "insured"; and (2) the other part represents "*residual*" uncertainty for which we have no way of calculating probabilities and hence cannot determine its risk value—the cost of this "residual" uncertainty being borne by society whenever it rises above the individual's ability to bear.¹⁶ The contractual provisions establishing premium and indemnity rates, therefore, must rest upon a combination of Knight's "statistical" and "estimated" probability judgments—with a strong accent on the latter.¹⁷

Grain, Feed and Cash Reserves: Because of the great uncertainty regarding the length of the good and poor periods, the width of the gap between poor crop output and critical survival limit, the movement of future prices, and the technical limitations of farm storage, I suggest that emergency grain and forage reserves on individual farms can hardly be expected to do more than compensate for a partial

¹⁴ G. Blumenstock, Drought in the U. S. Analyzed by Means of the Theory of Probability. *U.S.D.A. Technical Bul.* 819, April 1942, p. 61.

¹⁵ Summary Report of the Wheat Crop Insurance Consulting Committee, June 30, 1942, p. 17. Also Report of the Federal Crop Insurance Corporation, 1947, U.S.D.A., p. 7. See also Harold Halcrow "The Actuarial Structures for Crop Insurance," this *Journal*, Aug. 1949, Vol. 31, No. 3.

¹⁶ To conform with our goal, it should be worth exploring whether indemnities could be geared specifically to the "survival requirements" of individual farms.

¹⁷ Essentially this splitting of "total uncertainties" into a "budgeted partial risk" cost and an unbudgeted "residual uncertainty" cost is also implied in our unemployment insurance program where the compensation for a stated period of unemployment (e.g. six weeks or two months) is covered by premiums collected and where any "cost" of unemployment beyond that "insured" period is borne by the individuals and by society in some way through relief or public works. In this case, however, society's commitment to bear the cost of the "residual uncertainty" of unemployment is, at least in the U. S., not as explicit as in the case of crop insurance.

crop failure of one year. To carry larger reserves would in most cases prove economically unjustified. Within this limit, however, the returns from such individually accumulated reserves, especially of feed grains and forage, might be very substantial.

What might be an appropriate extent of a *centralized grain storage program*? Storage cost and rate of deterioration are probably substantially lower in terminal elevators than on the farm. As a specific measure for implementing our goal, an *emergency grain storage program* might be conceived that would permit farmers in poor years to *borrow grains up to their survival requirements* and to repay such loans *in kind* during good years with a modest interest charge. The price risk would thus be borne by the government, and the price-stabilizing effect of the storage program itself would reduce the cost of this risk to a minimum.

Cash and other liquid assets are not quite as "idle" as physical reserves as they can earn a small interest. They have no storage cost and do not "deteriorate." The increase in returns if they were invested by the farmer over the nominal interest they draw as liquid savings, however, should be charged against them. On the whole, liquid asset reserves as a safeguard against weather hazards are probably superior to grain or forage reserves kept for that purpose by individual farmers.

Drought Credit: In strictly economic terms, there is no reason why the saving should take place before the event of a poor period. In fact, the inexorable uncertainty of weather hazards speaks very strongly in favor of saving *after* rather than before. The type of credit should be one of "budgeted" or "supervised" loans, administered along the lines of FHA production loans, with local farmer committees advising the agency on applicants' eligibility, and with the borrower agreeing to budget his repayment schedule according to his ability to repay, in consultation with the lender. The agency should have ample power to exact repayment as soon as income rises above the critical survival limit. In all cases where repayment is delinquent on account of the borrower's negligence, incompetence or ill-will, the lender should have all the legal remedies for collection at his disposal.

Flexible Debt and Tax Payments: The foregoing three measures of crop insurance, reserves and drought credit are designed to compensate for income deficiencies below the survival limits caused chiefly by weather hazards. Such deficiencies can often be reduced

from the cost side, by adjusting traditionally fixed cost items to the income flow, to the farmers' ability to pay. The crucial cost items which lend themselves to such adjustments over time are debts and taxes.

The principal issue is how to apportion debt payments *over time* rather than bringing flexibility into the total amount of the debt obligation. I believe in using the full force of the law to safeguard the total amount of the lender's claim upon his debtor; but I am convinced that stability in the farm economy in high-risk areas requires the breaking of the time-rigidity of debt payments. Perhaps the most important type of measure would be a pattern of deferment privileges. The deferment should be granted subject to the borrower's agreement to budget his repayment schedule in consultation with the lender, as soon as his farm income rises above the survival limit. The same reasoning holds for making real estate taxes more flexible over time.

Diversification: Much is being made of diversification as a means of reducing price hazards in the Great Plains. Perhaps price variability of livestock products is significantly lower than that of grains. Undoubtedly, output variability in livestock enterprises is lower because of substitutability among feeds and greater managerial control over input-output ratios. Climatic and market conditions in the Plains place rather severe restrictions upon diversification. Lloyd Barber in his Kansas study found only slight differences in yield variability between the various crops, with wheat yields showing the lowest variability in most cases. Diversification within the crop system, therefore might not substantially reduce output variability due to weather hazards.

Opportunities for diversification in the Plains, however, do exist along two lines: (1) fuller use of non-crop land and land submarginal for crops in many years, say five or more out of ten, and (2) fuller use of under-employed family labor, especially during the winter season. Diversification that takes advantage of these two opportunities helps to prevent income from falling below the critical limit in three ways: by raising the level of income, by reducing the variability of total farm output, and by reducing price uncertainty.

Increasing Farm Size: Yield reduction due to crop hazards does not reduce appreciably the total cost of operating the farm. Operating costs, family living requirements, debt and tax payments stay practically the same whether the crop is good or poor. For this

reason, a larger farm is less vulnerable than a smaller one, within certain limits. A 50 percent reduction in net income means something very different to a farmer with a "normal" \$5,000 income than to one with a "normal" income of \$2,500. Hence, a fairly substantial level of "normal" output reduces the probability that a poor crop will press farm income down below the critical level of survival.

Price Supports: The specific significance of price supports to the high weather-risk areas of the Plains is two-fold: (1) price supports reduce the risk of poor crop years coinciding with ruinously low prices, and (2) grains are the dominant cash crop and have the highest price variability of any major farm product. The heavy dependence upon grains constitutes a serious price hazard which can be substantially reduced by effective price supports.

A long-range price support program that will prevent ruinously low crop returns, *but will not price the region's products out of their markets*, should be particularly helpful in stabilizing the Great Plains economy. A warning needs to be sounded, however, regarding production controls as a means for supporting prices. The danger that a drastic acreage reduction may coincide with a near crop failure is here much more serious than in low weather-risk areas.

There is a high premium for ingenuity, for finding new ways of doing things and for shaking off practices and institutional arrangements that were brought to the Plains from the humid east, and that do not fit the high weather-risk and arid characteristics of the Plains. Everytime a competent and honest farmer loses out in his fight against crop hazards, the region throws a challenge to the resourcefulness of farmers, community leaders, researchers and educators, to the wisdom of statesmen in our farm organizations, state legislatures and Congress. They all are called upon to make their contribution to the fullness and security of rural life in the Great Plains.

THE PROBLEM OF FARM BUSINESS SURVIVAL IN AREAS OF HIGHLY VARIABLE RAINFALL

DONALD C. HORTON AND E. LLOYD BARBER

Bureau of Agricultural Economics

RESEARCH on the problem of farm-business survival in areas of highly variable rainfall should be relevant in terms of yielding information on questions that have considerable long-time significance.

One such question concerns the conditions which cause some farm businesses to survive and others to fail in the same general economic environment. Is there evidence that the farm-firm which survives has been adapted successfully to areas characterized by extreme weather variability; or has survival been the result merely of historical accident or of the industry and good management of the farm operator? How one is to define "survival"—whether in terms of the continued existence of the farm business, in terms of some minimum degree of income stability or on some other basis—can be left to the discretion of the individual research worker.

A second question relates to the degree of stability farmers can afford. Can the farm business that takes adequate measures to safeguard itself against failure earn enough more in the long run to cover the added costs of this protection? In other words, is financial stability of the individual farm business feasible on a business basis in the face of extreme instability of yields and within the present competitive structure of agriculture in this area?¹

A third has to do with the personal distribution of heavy losses and heavy gains in high-risk agriculture. To what extent are the heavy losers and heavy gainers the same, and to what extent are they different groups of people? It is possible that returns from farming in high-risk agriculture over a period of years may average out as high as, or even higher than, those in other kinds of agriculture.

A final, but important, question concerns the attitudes that lie back of the competitive structure of farming in the area. To what

¹ Could a farmer who desires this degree of protection secure a larger net income as the operator of a more stable type of farm business in some other area, such as on a Wisconsin dairy farm, than he could earn on a farm characterized by highly variable crop yields? If so, the question arises as to what degree of protection is a reasonable goal for the farm operator under the present organization of farming in the area.

extent would the farmers of the area be willing to forego the opportunities for large gains in order to minimize the chances of disastrous losses? In theoretical terms, what is the nature of the "risk-preference function"? One aspect of this question is the extent to which the probability of losses is consciously anticipated by farmers who commit their resources to this area. Little, if any, empirical evidence is available with which to evaluate this question. In a sense, we are asking about the nature of the supply curve for entrepreneurship in high-risk agriculture.

These and similar questions help to identify needed fields of research, but they may not provide the most effective points at which to begin. It may be that we can learn something from the physical sciences about selection of specific projects. As in those fields the more effective research often may be that which superficially appears to be far removed from the central problem.

In the brief outline of specific fields of research which follows, two broad approaches are suggested. The first takes as given certain institutional arrangements, including public policies and the general competitive organization of farming. It then examines a number of possible lines of action that the individual farm business might take to safeguard itself against failure. The second takes as given an assumed pattern of farm business management and then inquires as to the costs and effects of public policies applied to entire areas.

Organization and Financial Management of the Farm Business

Research projects in this general field may be further divided into those with primary emphasis on the technical aspects of farming, and those that place primary emphasis on the financial aspects. What contribution to stability, and at what cost, may be expected from specific cultural and other strictly physical farm-management practices? This is largely a job of interpreting the results of physical science research in terms of costs and returns, with emphasis upon the contributions to stability of the farm business.

In this category falls research on the efficacy of physical reserves held by the farm business to increase stability of operations of the farm plant. To what extent can the stabilization of operations through the maintenance of feed and seed reserves be expected to give protection against financial breakdown of the farm business? It is conceivable that under certain conditions such farm-management policies might even lead to a greater degree of instability, as

when large physical reserves are held at the beginning of a period of falling farm prices.

Diversification of the enterprise and the provision of flexibility in the farm plant to allow a wide choice of alternatives are other stability measures of a primarily technical nature that require study. Within the rather narrow range of alternatives that exist in areas of high weather risk, do increased diversification and flexibility offer gains in stability that are at all commensurate with the costs?

In all of these problems, the characteristic uncertainty and variability of farm prices add to the difficulties of analysis. Prices are at once an important independent cause of instability and a factor which the research worker must include in his assumptions in studying the problems of weather risks. The widespread financial distress experienced in the Great Plains during the 1930's followed the occurrence of repeated crop failures in a period when farm prices were generally depressed. What the effect of such a series of poor crop years would have been in the absence of low farm prices presents a somewhat different question.

On the side of financial practices, we need to know more about the extent to which reserve and borrowing practices can contribute to greater financial stability of farm businesses. Holding liquid reserves in the form of cash and readily marketable securities may be viewed in part as the combination of a stable, low-yielding investment business with a relatively unstable farming business. The stable investment business is such that it can be liquidated or expanded with little inconvenience. Phrased in these terms, the question of the cost of such protection may be considered in terms of the returns that might be obtained by concentrating all of the capital in the farming business.

Whereas business-management practices as to financial reserves can be decided largely by the farm operator, the use of credit and the terms and conditions of borrowing depend also upon the lender. Unless a public lender is willing to take large risks as a matter of public policy, the contribution of credit to farm-business stability will be limited to the amounts loaned and the terms and conditions granted by lenders who are seeking to protect their own financial stability. Within these limits, however, lies a broad area of research as to the extent to which it is reasonable to attempt to use credit to supplement farm income in providing the funds to continue a

farming business in years of low income. Assuming that a farm operator has an assured line of credit, should he invest in farming assets and rely on credit to tide him over, or should he place more reliance on financial reserves in the form of low-yielding assets? The answer very likely may be that it depends. Even so, we should be able to determine upon what it depends in order to form a better idea of the respective limits of these related methods of accomplishing the same objective.

Of somewhat the same nature are research problems that relate to the use of insurance as a device for protection against catastrophic losses. The contribution of insurance, except that which may be provided on a cost-sharing basis by a public agency, depends upon the limits imposed by insuring agencies as well as upon the use the farmer makes of insurance. But within these limits are many questions relating to the extent to which stability can be promoted by agreeing to a schedule of fixed insurance charges as the price of protection against hazards which may be unrelated to the major forces that determine fluctuations in farm income. Here one of the problems is the extent to which protection against catastrophic losses is feasible without thereby building up fixed insurance charges that may accentuate financial difficulties in prolonged periods of low prices and yields. In this field fall also life insurance for the family as well as health, accident, and liability insurance. Here, as elsewhere in the consideration of methods of protection against failure of the farm business, the question often is one of how much protection is feasible under the present competitive organization of farming in this area.

In some respects equity investment by outsiders in the agriculture of the area is the converse of maintenance of liquid reserves by the operator. In the case of equity investment by outsiders, two separate businesses are combined in one operating farm. The farm operator conducts a farming business with leased assets and the outsider conducts an asset-owning business; whereas the owner-operator who maintains large financial reserves operates both a farming and a low-yield investment business. In the former, stability is achieved by placing a part of the uncertainty-bearing on an outsider. In the latter, greater stability is achieved by investing in high-grade, low-yielding assets.

This is not the place to speculate on the best techniques for studying these problems or to anticipate results that might be ob-

tained. The scarcity of usable data, however, will continue to tax the ingenuity of research workers. Most of the data now available are byproducts of some other process. Emphasis needs to be placed on the systematic development of statistical series for individual farms that will permit construction of the empirical models needed to study most of these problems. This means that existing data need to be studied for what can be gotten out of them, both as to substantive results and as to ideas for future collection of data. Building up a body of basic data and development of appropriate concepts and other tools of economic analysis are slow jobs at best. The sooner we get started at them the sooner will it be possible to do an effective job of reducing the area of controversy over appropriate farm business and financial management by a corresponding enlargement of the area of tested knowledge about the problem of farm-business survival in the high-risk agricultural areas.

In studying the types of problems outlined above, the research worker should be prepared for results which indicate rather narrow limits within which the individual farm can deal with the business-survival problem. Nevertheless, until we know more about these limits we are not very well prepared to say in what respects governmental or other group action is a superior method of handling the problem.

Governmental Action Affecting Entire Areas

We turn next to the second broad area of research which focuses on action of government in relation to entire geographical areas.

To do effective research, it is often necessary to hold constant for the time being certain phenomena that are not under study at the time. In a study of governmental and other group action to protect farms against failure, it may be most useful to assume that farm business and financial management is constant. One needs to assume also that there are limits to the costs the public is willing to incur to promote greater stability of farm businesses. With outside limits on costs, it is then possible to inquire regarding the specific costs and probable effects of a number of possible kinds of governmental action. Here again it is useful to distinguish between those activities of government that are designed mainly to influence technical aspects of farming and those that operate more at the financial level.

In studying the effects of alternative public policies in this field,

the research worker should take some liberties in assuming, for the sake of analysis, that legal and other institutional obstacles could be overcome if society really wished to follow particular lines of action. If the research worker restricts himself to his specialized job he should be free to study probable consequences of possible policies that seem at the time to be far removed from the realm of immediate adoption.

Hence, one area of research in governmental action relating to the technical aspects of agriculture might well be to determine the effects of specific regulations or inducements designed to direct high-risk agriculture into types of farming that are subject to less variation in yields. It would be instructive, for example, to assume that during the middle 1920's certain areas had been definitely zoned against crop-farming, and then follow through the next 25 years to determine probable net income both under this plan and under farming practices that have been actually followed. We might find resource allocation for the entire period has not been too badly out of line, but the personal distribution of gains and losses might be unsatisfactory.

A more tangible subject for study is the amount of stability for a given amount of cost to be expected from public expenditures on irrigation development. Considerable empirical data are available for such research. To what extent do higher fixed charges and greater vulnerability to small variations in prices replace greater variability in yields as potential causes of farm business failure when a shift is made from dry-land to irrigation farming? How much stability to entire communities, including adjacent dry-land farming, is given by irrigation farming? What does irrigation farming do to the distribution of uncertainty-bearing among farm operators, absentee landlords, and creditors; and is the resulting capital structure more or less vulnerable to variations in prices and costs than that characteristic of dry-land farming? Although it may require some ingenuity, the research worker may find that much of the basic data for such research is already available.

On the financial side, the research worker should also give considerable freedom to his imagination in the choice of projects. For example, what would be the fiscal cost and the distribution of benefits of a minimum net income guarantee to each farm family in a specified area? Similarly, what would be the fiscal cost and income effects of a government-sponsored crop insurance program in

which a specified part of the insurance premium was carried by the Government? What would be the net cost to the Government in the form of reduced income-tax collections of a plan whereby (1) the income-tax accounting period would be made long enough to average out years of high and low income, and (2) the farmer would be required to invest in government bonds in years of high income to obtain the advantages of tax reduction? Assuming that the public is willing to incur a given level of costs in one form or another to reduce the rate of farm business mortality in this sector of the economy, research studies of this type should provide a better basis on which to debate the relative merits of different programs involving similar cost to the Government.

The research areas so far discussed have emphasized direct stabilization of income. On the expense side there are also possible policies whose probable consequences need investigation. What, for example, would be the fiscal cost and probable effectiveness of a government-sponsored credit institution with power to finance specified fixed charges of both farmers and local governments in times of low farm income? The specified fixed charges presumably would include fixed operating costs of both farms and local governments when they are viewed as going concerns. Important in the consideration of effectiveness of such measures is the question of *which*, and what proportion of, farm businesses would be helped immediately by such a financing arrangement. Such a study would need to consider the prospect of losses on loans in evaluating probable public costs.

As emphasized at the outset of this paper, a real contribution can be made by research to the intelligent consideration of important public policy questions without attempting to give answers to questions that are political by their very nature. It is not serious if we spend time enlarging our knowledge of possible effects of actions that are never taken. Probably the transfer of basic knowledge from one area of investigation to another is large. There is even danger that we shall be so practical in our short-run choice of research projects that we may still be dealing with the depression of the 1930's when new problems arise.

DISCUSSION

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The Great Plains may be characterized—as has been done by Dr. Schickele—as a region within which good and bad crop years have occurred in bunches. In spite of this bunching, students of this weather and yield experience are almost unanimous in their conclusion that no definite pattern of length or sequence in weather cycles has been established. In one study based on tree-ring growth, covering 534 years, it was concluded to be impossible to work out any definite pattern of yield series. In another tree-ring study, covering 152 years, the conclusion was that cycles could not be picked out very successfully. In a study of wheat yields representing all the major wheat producing regions of the world it was concluded that chance presumably dominates fluctuations in yields from year to year in individual regions.

Thus, changes in weather from year-to-year usually have been regarded as random fluctuations and scepticism is general as to the existence of periodic cycles in meteorological data. This does not imply that the irregular fluctuations are entirely accidental or fortuitous, but for purposes of prediction the pattern and sequence of weather phenomena takes on the character of a random statistical probability. The bunching of good and bad crop years which has appeared so pronounced in the Plains in the last 20 or 30 years may be a random occurrence in the long range view of weather of the Plains. Uncertainty exists in respect to the weather for next year, for the next five years, or perhaps for the next 15 or 20 years but, on the basis of a priori judgment, a relatively accurate estimate may be made of the general level of weather conditions for the next 50 or 100 years. If this is the case, an empirical evaluation is possible in respect to this longer period of time; a statistical probability exists and the situation is insurable. On the basis of these data, however, the actuarial losses which would be encountered by an insurer should be estimated only in respect to this longer period of time.

For purposes of crop insurance, statistical probability cannot be determined with respect to the individual farmer's yield record in the Plains (1) because his yield record cannot be determined with the desirable degree of accuracy for an adequate period of time, and (2) because changes in a farmer's methods, practices, type of farming, etc., may make the yield probabilities significantly different from the yields existing in the past. Therefore, the type of all-risk crop insurance which has been in operation in the United States is unadapted to the Great Plains in an actuarial sense. Statistical probability may be determined on two other bases in the Plains: (1) long-run yield records for a crop area—such as a county, part of a county, or several counties—and (2) long-run weather records for an area.

In the case of area-yield insurance, a "normal" yield would be developed for each area. Premiums and indemnities would be based on yield probabilities for the area. A farmer in effect would insure a share of the crop in the

area and he would receive an indemnity whenever the area yield was below the level at which he had insured his "share."

In the case of weather-crop insurance, the long-run normal precipitation, humidity, temperature, etc. would be determined for a locality or area. A farmer could insure for a certain percentage of normal weather; i.e., he would receive an indemnity any time the weather in terms of the phenomena selected for the formula was below the standard insured

The relationship between problem, program, and research is a mutual one, as Horton and Barber have indicated. Research should be directed with the purpose to determine how or in what forms stability devices may be developed. Two processes must be undertaken. One is to think through the contribution which any device or program may make and the other is to assemble the data to determine how it may be adapted. In the case of crop insurance, for example, we should have a clear-cut outline of the purpose of insurance and a carefully reasoned statement as to the various forms which the program might take. Then the degree of income stability and the contribution toward efficient use of resources which can be made through use of insurance would be determined through inspection of models representing the various classes of situations. For this purpose we should obtain much greater detail than we now have on the internal construction of farm cases; especially on the individual yield patterns of farms within selected communities.

Likewise in the case of storage—the functions which storage may perform in the Great Plains should be identified and the type of program outlined which could best serve these functions. To what extent should storage be used toward stabilization of feed supplies and what types of storage facilities and instruments are best adapted? If our progress in attempting to answer questions such as these is disappointing, it may be because we have not thought of storage as a device which may be peculiarly adaptable to the livestock economy of the Plains and as a program which must be related to the yield variability of the Plains if the major function is to be performed.

The crucial question in this type of research is the concept the researcher has of the problem and the adaptation of the programs. The same set of basic data may be made to serve more than one purpose. For instance, the idea of expanding the feeding of wheat is currently under investigation in the Plains region. A pertinent question may be. In addition to data on costs and returns, how stable will be the farmer's supply of wheat? The answer to this is dependent both on the yield variability as well as on the storage program followed. The same data on yield variability may be basic to wheat feeding, storage, and crop insurance. Also yield data by farms over a period of years combined with information on prices and costs should be useful in determining what kind of credit policy a lender should follow.

In this type of yield uncertainty, without such stability devices the individual farmer finds it difficult if not impossible to budget inputs or to arrange the capital structure in a manner which will both maximize his net returns and carry him through a period of low income years. He is forced to compromise between the maximum gain and the minimum loss

and precise answers cannot be made to important questions of farm organization—involving diversification, feeding, storage, size of unit, type of farm, etc. Devices or programs designed to counteract some of the production uncertainty should allow greater precision in plans for farm organization and management. Consequently, much greater progress should be made in research fields dealing with farm organization and management in the Plains if programs counteracting some of the production uncertainty were successfully adapted.

The programs and the types of research are interrelated. The challenge involves (1) a type of research directed toward the development of programs which can contribute both to income stability and to the efficiency of resource utilization, and (2) a type of research directed toward the adaptation of farm units to the environment and to the types of programs which may be developed.

DISCUSSION

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In my opinion, three kinds of research require more emphasis than given to them in the Horton-Barber paper. The first of these is the need to further develop the theory of dynamic farm firms. A certain air of indefiniteness was present in the Horton-Barber paper about how to proceed in studying the roles of physical and financial flexibility and diversification. This indefiniteness indicates a need, on the part of our profession, for a more adequate theory of the firm. The need also showed up in Professor Schickele's paper where the theory available to him was only moderately productive of aids to the family farm. We might further localize this need by stating that a more adequate theory of the decision-making process is required.

Some exploration on my part convinces me that a combination of the statistical theory of sequential analysis with the theory used by Professor Schickele would yield realistic concepts of windfall profits, windfall losses, and more realistic concepts of returns to management, risk and uncertainty. Also, such a combination promises help in understanding the role of physical and financial flexibility in the making of decisions in noncertain situations. Such an understanding might suggest new managerial principles for use by firms facing high yield risks.

There are other possible lines of investigation which might improve the existing theory of the dynamic firm. For instance, Professor Schickele placed heavy emphasis on uncertainty concerning the length of runs of dry and wet years. Perhaps, the statistical techniques for handling probabilities of lengths of runs could be combined with the present theory of the dynamic firm to yield useful results. Might not such a combination help us understand the actions of a Plains farmer who says, "We've had 12 years of good weather in a row—I'm going to get ready for some dry years"?

It seems that most formal statistical techniques have informal counterparts in the decision-making processes of entrepreneurs. Currently, a rapid rate of progress in the field of statistical theory is offering us an unusual opportunity to work new techniques of statistical analysis into the theory of entrepreneurial decision-making.

Until we have a theory which adequately handles the thought processes of entrepreneurs, our understanding of our five to six million farm firms will remain poor. And, it will be especially poor for firms in high risk areas. Our current lack of understanding reduces the efficiency of our research—our empirical research gropes, only partially guided, and we are unable to predict the results of proposed public policies and institutional changes.

Our difficulty in predicting area wide results of public policies reminds us again that we have practically no theory for combining the effects of risk and uncertainty on the actions of individual firms into area wide effects. Both papers presented here today suffer from our profession's inability to supply a conceptual framework for going from the micro to the macro aspects of our *dynamic* economy. This is the second kind of research which requires more emphasis.

I turn now to a consideration of the third kind of needed research into the consequences of using alternative forms of farm production units more extensively. One reason for carefully appraising other kinds of production units as alternative ideals for the Great Plains is the fact that bad weather often adversely affects the welfare of families closely tied to the production unit. Professor Schickele has emphasized that the income level required for the family standard of living is part of the "critical limit of survival" for family-type farms. The question raised here is far from new—by implication, the universal appropriateness of the family farm was questioned in a report entitled, "The Place of the Family Farm in Our Land Tenure System." This report was prepared by Committee I of the Farm Tenure Conference held at Chicago in 1946. It would be appropriate for our profession to carry out an appraisal of the social and private implications of using other types of production units more extensively in high risk areas. For example, what would be the social and private consequences of large-scale corporation farming in areas of high wheat yield risks as compared with family farming? Another question might inquire as to the private and social consequences of more businesses which include both farm and nonfarm branches? Still another question could ask might not human suffering be less, human happiness greater and public costs lower if certain high risk areas were entered once each year for planting and again for harvesting in the years which produce worthwhile crops? These are examples of questions which might be profitably studied before finally settling on the family farm as the ideal production unit for high risk areas.

THE IMPORTANCE OF IRRIGATION IN THE ECONOMY OF THE WEST

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I SHALL discuss the importance of irrigation in the economy of the West from two approaches: first, the extent of irrigation and some of its characteristics in relation to the economy; second, ways in which irrigation is of economic importance to certain groups of people.

By "the West" I shall refer to the 11 Western States, the states in which irrigation is of greatest importance. These states comprise more than a third of the land area of the country, and contain about 85 percent of the irrigated land.

The most recent statistics on irrigation for the West as a whole are somewhat old. In the 1945 Census of Agriculture, data were obtained on the number of irrigated farms and on the acreage irrigated.² For characteristics of irrigated land and data on irrigation enterprises, it is necessary to go back to the 1940 Censuses of Agriculture and Irrigation. Until we take the Seventeenth Decennial Census next year, however, these statistics will be all that we have except for areas where special studies have been made.

I

About one-half of the half-million farms in the West are irrigated in whole or in part. More than half the income of farmers is from irrigated crops and from livestock and livestock products obtained from irrigated crops and pastures.

According to the 1940 Census about 75 percent of the employed persons in all the extractive industries in the West—agriculture, forestry, fisheries, and mining—were employed in agriculture. Presumably about one-half of these, or 35 or 40 percent of the total employed in the extractive industries, were employed in irrigated farming. The proportion of workers in the nonextractive industries and occupations in the West who are supported indirectly by irrigated farming, doubtless is less than the proportion of workers in the extractive industries who are directly employed in it. This is

¹ Responsibility for the opinions and conclusions expressed is entirely the author's.

² *Farm Census Shows Substantial Increase in Irrigated Land*, U. S. Bureau of the Census, processed release, undated.

because some of the other industries—the Hollywood movie industry, for example—are geared to the entire national economy rather than to the economy of the West. It appears, however, that possibly as much as a third of the total population in the West depends on irrigated farming for its livelihood, directly or indirectly.

The irrigated area in the 11 Western States in 1944 was 17.3 million acres. In the remainder of the country only 3.2 million acres were irrigated, of which more than a third were in Texas.

Without irrigation, most of these 17 million acres would be barren desert or low value grazing land. With irrigation, it "blossoms like the rose" and produces crops that had a farm value of over two billion dollars in 1947 according to estimates of the United States Department of Agriculture.³ That was an average value of around \$150 per acre of irrigated cropland harvested, more than double the United States average for nonirrigated cropland harvested.

California has the largest irrigated area of any state, nearly five million acres in 1944, almost a fourth of the entire irrigated acreage in the country. Colorado is second, with 2.7 million acres; and Idaho third, with more than 2.0 million.

In a study of the longterm outlook for western agriculture, Clawson and Calhoun of the Bureau of Agricultural Economics estimated that 72 percent of the cash farm income from crops and 32 percent of the income from livestock and livestock products originated from irrigated land in 1939, and that irrigation produced 54 percent of the combined total income from crops and livestock.⁴ The more recent estimates of value of irrigated crops in 1947 by the United States Department of Agriculture are that 70 percent of the value of all crops in the Pacific Coast States was obtained from irrigated land and 60 percent in the Mountain States.⁵

Irrigation is responsible for the population of the West having more abundant, fresher, and lower priced supplies of fresh vegetables and fruits. Without irrigation much of these products would have to be imported from other parts of the country. Without irrigation practically all dairying in the West would be devoted to

³ *Irrigation Agriculture in the West*, U. S. Department of Agriculture, Miscellaneous Publication No. 670, November 1948, page 3.

⁴ Marion Clawson and Wendell Calhoun, *Longterm Outlook for Western Agriculture*, Bureau of Agricultural Economics, Berkeley, California, June 1946, processed, pp. 49-51

⁵ *Op. cit.*, *Irrigation Agriculture in the West*, page 3.

market milk production and most other dairy products would have to be imported.

Irrigation bears an important relation to the western livestock industry. More than two-thirds of the entire irrigated acreage is used for producing feed crops and pasture. Dairying is the principal type of livestock production on the irrigated lands, but a large part of the irrigated crops and pasture is used for beef cattle and sheep production. Nearly three-fourths of the total land area in the West is range land, used chiefly for grazing beef cattle and sheep. The West has always produced an important surplus of beef cattle and sheep to supply the needs of the rest of the country. For the past three decades, however, production of range livestock has been declining, as a result of declining productivity of the range.⁶ Increasing production of irrigated feed crops and pastures has offset this declining range production to a considerable extent.

Irrigated feed production also makes possible the fattening and finishing of more beef cattle and sheep in the West to supply the expanding western markets. In the early days most of the range cattle and sheep were shipped east to the cornbelt for feeding. As the population of the West increases, more feeding is needed in the West, which would be impossible without the feed crops produced by irrigation.

The net result of new irrigation development is chiefly more beef cattle and sheep production than would have occurred without the irrigation development. This probably sounds like heresy to some persons, because most new irrigation development is based on anticipated production of fruit, vegetables and other cash crops, and dairying. The point is, that there is already a large acreage of irrigated land in the West now used for feed crops that is suitable for producing fruits, vegetables, and other cash crops, and that can and will be used for such crops as rapidly as the market warrants. Also, whenever the western market for dairy products warrants, use of irrigated feed crops and pasture can and will be shifted from beef cattle and sheep feeding to dairying. With new irrigation development, needed increase in production of the more intensive commodities may occur in the new area instead of in some area where it otherwise would have occurred, or production in the new

⁶ H. E. Selby and Donald T. Griffith, *Livestock Production in Relation to Land Use and Irrigation in the Eleven Western States*, B.A.E. Berkeley, Calif., March 1946, processed, p. 8.

area may even displace production in an older area. But the net result of the new irrigation development is largely more beef cattle and sheep produced in the West than would have been produced without it.

It should be noted, however, that the result of new irrigation development in a local area may be less, rather than more, livestock feed in that particular area. The reason for this is that the additional water supply may make it more profitable to raise sugar beets, beans, or other cash crops on land that was used to produce hay when the water supply was less adequate. Such displacement of feed production by cash crops in a certain area, however, tends to postpone similar displacement that otherwise would occur in some other area.

A most important aspect of irrigation is its stabilizing effect not only in the agricultural economy, but in the entire economy of the West. Irrigated farming is much less subject to hazards of weather than nonirrigated farming. Widespread drouth and resultant failure of nonirrigated crops is therefore not so great a hazard to the total economy as it would be if there were no irrigation. By diversifying farm production irrigation makes the region less subject to business depression.

Irrigation is only one phase of the control and use of water resources in the West. Other important phases are flood control and use for hydroelectric power, navigation, domestic water, and recreation. Most of the larger irrigation developments are multiple-purpose projects, combining irrigation and one or more of the other purposes of water control and development. In many of these projects no single purpose would justify the development, but by combining the several benefits the project becomes feasible. Thus irrigation is a factor in obtaining more complete utilization of water resources, and this in turn makes possible more complete utilization of other resources.

But now, although irrigation provides the means by which a considerable proportion of the population in the West makes its living, does that mean that those people are any better off as a consequence of irrigation? Perhaps they could make just as good as or better livings elsewhere. Who benefits from irrigation? Is anyone worse off as a consequence of irrigation? This brings me to the second part of my discussion, on ways in which irrigation is of economic importance to certain groups of people.

II

I shall discuss very briefly some of the ways in which it seems to me that irrigation is of importance to six groups of people, and then comment on its significance to the general public.

1. *Settlers on irrigation projects.*

Probably most people think of the settlers on irrigation projects as the principal beneficiaries of irrigation. In most cases, however, the amount the settler has to pay for his farm, or for his farm and irrigation construction cost combined, is as much or more than its full economic value for farming. Usually he pays about as much as he would have to pay for a nonirrigated farm of comparable productive capacity. Even on Federal projects subsidized by interest-free money, it is questionable whether the settler gets much benefit from the subsidy, for he is required to pay "all the traffic will bear." A statement sometimes heard in the West is that it takes three crops of settlers to make an irrigation project succeed, and that has been almost the case on some projects.

A fundamental principle of Federal Reclamation policy however, ever since the passage of the original Reclamation Act in 1902, has been to provide family size farms for settlers. The policy also is to give preference to families who have no other means of earning a livelihood, or who have been compelled to abandon other farms through no fault of their own. Doubtless these policies have provided opportunities for farm ownership to many settlers whose only alternatives for employment were as farm tenants or laborers. Many other irrigation farmers have developed their own irrigation facilities through individual or cooperative effort and thus have provided themselves with successful farms and homes, and sometimes they have obtained substantial financial returns. Certainly the early Mormon pioneers in the West owed their settlement possibilities to irrigation. But whether most settlers, on all irrigated lands, have been provided better opportunities by irrigation than they could have found elsewhere, is at least questionable.

2. *Owners of land when it becomes irrigated.*

For this group of people the result of irrigation development varies from large financial gains to large losses. When land is irrigated it enhances considerably in value as a result of its increased

productivity. In some cases, the enhancement in land value considerably exceeds the cost of the development, and represents a substantial financial gain to the landowner. In other cases, the cost of irrigation development exceeds the enhancement in value, and the landowners may lose money, or may default on their payment of the irrigation cost and thus pass on part of the loss to the financiers of the development.

With government development of irrigation one of the problems is to prevent speculative increase in the value of the land to be irrigated from absorbing the ability of the land to pay for the irrigation development. By means of antispeculation laws and regulations, owners of land to be irrigated can be restricted reasonably well from selling the land for more than its appraised value without irrigation. But the ability of the land to pay for the irrigation development often gets capitalized into land value through farm mortgage borrowing. The settlers are able to incur so much mortgage debt that it becomes impossible for them to keep up both their mortgage and their irrigation payments. When that situation becomes general throughout a project, it is usually the irrigation payments that are compromised, even though they may be the prior lien on the land, because public opinion would be too unfavorable toward mass foreclosure of the lands for the irrigation payments.

3. Investors in irrigation development.

In some cases the owners of land to be irrigated are able to finance the cost of the irrigation development themselves, but more often borrowed capital is required. Many individual investors have lost money on unsound irrigation development. Many bonds of irrigation enterprises have sold for a few cents on the dollar, or have become worthless. In a recent study made by the Bureau of Agricultural Economics and the Soil Conservation Service, but not yet published, of about 50 selected irrigation enterprises throughout the West, it was found that the financiers of more than a third of the enterprises had lost substantial proportions of their invested capital.

The reason why irrigation enterprises fail financially is almost always that the cost of the development exceeds the value of the increased productivity of the land; that the ability of the land to pay for the development is capitalized into land value before the cost is paid; or, in most cases, a combination of these circumstances.

Financial failure often is ascribed to poor land or to an insufficient water supply. The fundamental cause, however, is the cost of the development relative to the benefits. Relatively poor land can pay for irrigation, and practically any kind of water supply warrants development, if the development cost is low enough.

Financial failure seldom results in abandonment or discontinuance of an irrigation enterprise. Whatever amount the settlers can pay is better than nothing for the creditors. The settlers on the project usually can pay as much or more than could be realized by dispossessing them and getting new settlers. After the financiers of the enterprise take their loss and reduce the debt down to the ability of the settlers to pay, the project becomes a "successful" one.

4. People in industries and occupations that serve irrigated farming.

This group is comprised of the people who transport, market and manufacture the products of irrigated farming and those who supply goods and services to the people engaged in irrigated farming. Irrigation development creates opportunities for employment in the vicinity of the development. It creates need for various specialized occupations such as irrigation engineers, builders of irrigation works, manufacturers of irrigation equipment, water right lawyers, public officials who supervise use of water, and even for college professors who teach irrigation, and agricultural economists who study the economic problems of irrigation.

Where the development is in an entirely new area, entirely new opportunities in the service occupations are created. If the area is partly developed and settled at the time of the new irrigation development, increased volume of business is provided for service occupations already there. The person already engaged in the service occupations may or may not benefit from the increased business. If only one railroad serves the area, it is rather sure to receive an increase in its volume of business. But in some lines of business the new development may attract so many competitors to the area that the volume of business available to the existing firms decreases.

5. Owners of land in villages and towns in irrigated areas.

The need for service industries and occupations in connection with irrigation development causes the villages and towns in the

area to grow and the land to increase in value for both business and residential purposes. As a part of the planning for the Bureau of Reclamation's Central Valley Project in California a study was made of relationships over a period of years between the assessed value of farm real estate and that of nonfarm real estate. The study covered the Central Valley and also the Imperial Valley, both predominantly irrigated farming areas. In both areas it was found that for a given amount of increase in the total value of farm real estate, an increase of about 25 percent as much occurred in the total value of nonfarm real estate.⁷

In a few cases a nominal tax has been assessed on nonfarm land in an irrigated area to help pay the cost of the irrigation development. On the whole, though, the owners of such land have received such enhancement in value as a gift. It is quite probable that their gains from increment in land value, in the aggregate, have been greater than the gains from increment in value of the irrigated land over and above the costs of the irrigation development. It is no wonder that chambers of commerce promote irrigation development in their vicinities.

6. People who would have been better off without irrigation.

As the population of the country increases, more food is needed. Irrigation development increases the acreage of land suitable for crop production. This is one way of getting an increased supply of food, but is by no means the only way. The acreage of land suitable for crop production also can be increased by land clearing, drainage, and soil conservation measures; the production of food on presently available cropland can be increased by more intensive farming; and additional food can be imported. If any particular irrigation development had not occurred, most of the increase in food supply that it provides would have been obtained through development of additional land by other means, or else by more intensive production on existing land. Instead of the opportunities for employment provided by irrigation development, opportunities for employment would have been provided by the increased food production elsewhere.

Increases in value of farm land, in volume of business of service

⁷ Cf. my article *Indirect Benefits from Irrigation Development*, *Journal of Land and Public Utility Economics*, February 1944, p. 50.

industries, and in value of land in villages and towns, more or less comparable to those that occurred in the irrigated area, would have occurred elsewhere. More or less comparable financial gains to those realized from the irrigation development would have accrued to different persons, who were prevented from receiving them by the irrigation development.

Without the irrigation development, the increased farm production and its corollary economic effects might occur in some other part of the country, some other part of the West, some other part of the same state, or even in the same county; or it might occur as a very slight increase diffused throughout many farming areas. If there were no irrigation in the West, the nonirrigated farm land in the West Coast valleys certainly would be at a premium for production of fruits, vegetables, and market milk to supply western markets, and its value would be much higher than it is.

The history of most irrigated areas shows a rather constant increase in intensity of farming—more fruits, vegetables, and other cash crops, or more dairying. This is the result of expanding market demand for these commodities. As more of these higher value commodities are produced, the value of the land increases, because intensity of farming, or value of crops per acre, is the most important determinant of value of irrigated land.⁸ New development of irrigated land may prevent or postpone opportunity for present irrigation farmers to grow more profitable crops and benefit by resultant increase in value of their land.

Increasing farm production by means of new irrigation in periods of surplus crop production increases the quantity of surplus production, and that further depresses farm prices. Even though the crops produced on the new land are not those in surplus supply, they tend to prevent possibilities of diverting land in other areas from use for surplus crops to use for nonsurplus crops. Particularly in times of surplus production, therefore, farmers in other parts of the country look askance at government development of irrigation in the West. There is considerable time lag, however, between the construction of most irrigation projects and the bringing of the land into production. If irrigation construction could be maximized in periods of depression and minimized in periods of prosperity, it not only would bolster employment in the depression periods but also

⁸ Cf. my article *Factors Affecting Value of Land and Water in Irrigated Areas*, *Journal of Land and Public Utility Economics*, Aug. 1945, p. 253.

would tend to bring in the additional production during the following periods of prosperity when it is needed.

Lastly, we come to consideration of the general public and ways in which irrigation in the West is of economic importance to it. The Federal government is spending a few million dollars a year to subsidize irrigation development through the device of interest-free money. What does the general public get for that expenditure?

As population increases, if additional farm land is not developed the additional food that is needed can be obtained by more intensive farming of present farm land. To obtain the additional production in this way, higher prices for food are necessary to cover the additional inputs of labor, machinery, and fertilizer. The higher prices will apply not only to the additional production, but to the total production of food. But if the additional production of food is obtained by development of additional land, and if the development cost is not too great, the increased production may be obtained at the same costs as present production.

Preventing only a very slight increase in food prices could very easily justify the expenditure of many millions of dollars by the general public for irrigation development. So far as I know, no way has been devised for measuring the relationship between irrigation development and food prices. If my theory is valid that the net result of new irrigation development is chiefly production of beef cattle and sheep, a method of evaluating subsidy of irrigation in terms of prevented rise in cost of food perhaps lies in the relationships of supply and demand to prices of beef cattle and sheep.

Obtaining increased food production by means of irrigation development rather than by more intensive production on existing farm land has the important additional advantage that it increases the total area of cropland and thus adds to the natural resources of the country. This advantage also is difficult to evaluate—in time of war the additional resource may be invaluable.

FEDERAL AID TO IRRIGATION DEVELOPMENT

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THE development of irrigation is a part of the history of agriculture. Modern irrigation in the United States began slightly more than 100 years ago—nearly two decades before enactment of the first homestead law. It was an adjustment to the arid conditions of the West in the face of urgent need for food for an increasing population and winter feeds for expanding livestock industries.

As with other lines of agricultural development, early irrigation was undertaken without benefit of direct Federal aid. Many small irrigation systems were built by individuals or by small partnerships. Conditions in many places, however, required action by larger groups so settlers organized into cooperative or mutual water-ditch companies for constructing and operating irrigation systems. Understandings regarding "water rights" for irrigation purposes became established by usage and over a period of years gradually became formalized into law by statutory enactments and court decisions. Early irrigation associations often based on informal agreements have also been formalized under various state laws into mutual or cooperative irrigation companies, associations, or irrigation districts.

Projects that required simple low-cost construction were sought. The better, more easily developed lands near dependable and readily accessible water supplies were selected for development. As the more favorable sites were occupied, project development became increasingly more difficult and costly. Storage dams, pumping plants, and long canals over difficult terrain increased the cost of later irrigation developments. To assist in financing and operating such irrigation projects, all of the 17 western states have passed irrigation district laws. These differ in detail but irrigation districts set up under state law generally are public or quasi-public corporations having authority to levy assessments against all lands within their boundaries that benefit from district facilities. These districts have proved very useful, particularly in taking over and operating systems built by the Federal Government. However, they have not

* The writer acknowledges with thanks many helpful suggestions received from members of the staff of the Bureau of Reclamation in Washington, D. C., and Boise, Idaho.

commanded financial resources sufficient to construct the more costly projects. A few states, cities, and commercial companies have assisted in irrigation development, but these give little promise of major future contributions except that receipts from water furnished to cities and industries from multiple purpose projects may contribute substantially to payment of construction costs of some projects.

As the nineteenth century drew to a close it became apparent that Federal funds were needed to finance irrigation development if reasonably full utilization of western water resources was to be achieved. As early as 1888, funds were appropriated for the purpose of investigating the extent to which arid regions could be redeemed by irrigation. Two years later an Act provided that patents issued for lands west of the one-hundredth meridian contain right-of-way reservations for ditches or canals constructed by authority of the United States. In 1902 the Federal Government, by passage of the Reclamation Act, entered the field of direct promotion of irrigation. There were then around eight million acres of land under irrigation. By 1945 Federal and private developments had increased this to approximately $19\frac{1}{2}$ million acres. In 1945 Federal works were capable of furnishing water to more than 5,000,000 acres. Slightly over 2,437,000 acres could be furnished a full supply of water from Federal facilities; 521,000 could be furnished a supplemental supply of storage water; and 2,055,000 could be furnished a full or supplemental supply under special contracts. At present, roughly one third of the irrigated acreage is served by individual and partnership enterprises and a third by mutual or cooperative companies. Some 76 percent of the irrigated land in the 17 western states is served by works constructed by private interests, and 13 percent from works constructed by the Federal Government. The remaining 11 percent is served by both Federal and private works.¹

From 1945 to 1948 acreage served by the Federal projects increased approximately nine percent. Future development of large irrigation projects is likely to be mainly in the hands of the Federal Government, although significant acreages may yet be brought under irrigation by individual enterprises through pumping from farm wells or neighboring streams and ponds and by construction of small farm reservoirs.

¹ *Irrigation Agriculture in the West*. U.S.D.A. Misc. Publication No. 670.

When the Reclamation Act was passed in 1902, it apparently was expected that with modest financial assistance from the Federal Government, reclamation would pay its own way. According to a Fact Finders Committee, appointed by Secretary of the Interior Hubert Work in 1923 to make a comprehensive review and appraisal of the first two decades of Federal reclamation experience, it was initially contemplated that money used by the Reclamation Service for reclaiming arid and semi-arid lands by irrigation should not be raised by taxation. Construction funds were to be derived from the sale of public lands in the states to be benefited, to which were added later such moneys as are derived from royalties from oil and potash lands.² Receipts from extractive resource-depleting industries were thus to provide funds for the construction of relatively permanent continuous-income-producing irrigation works. It was intended that this fund should not be lost but should be held in trust as a revolving fund, and reinvested in the reclamation of arid land as fast as paid back.

The Reclamation Fund, however, proved to be inadequate. Net construction cost of projects subject to repayment, as of June 30, 1923 already was, in round numbers, \$143,000,000. This large construction program had exhausted the Reclamation Fund and made necessary a loan of \$20,000,000 to keep the work moving. Such loans also proved inadequate. Direct appropriations have provided most of the construction funds of the Bureau of Reclamation. Total accretions to the Reclamation Fund, as of June 30, 1948 were approximately \$250,000,000, whereas total allotments and appropriations for reclamation purposes had reached a total of around \$1,530,000,000.³ Appropriations for construction purposes to the Bureau of Reclamation for fiscal 1949 were around \$240,000,000. A Bureau of Reclamation program calls for expenditures of \$3,891,900,000 during the 7-year period beginning with fiscal 1948.⁴

With respect to repayment of irrigation costs Congress has steadfastly maintained its original position that costs assigned to irrigation works, including investigation and engineering, should be repaid to the United States. It has, however, liberalized its re-

² Senate Document No. 92, 68th Congress, 1st Session.

³ Annual report of the Secretary of the Interior, 1948.

⁴ The Reclamation Program, 1948-54, U. S. Dept. of Interior, Bureau of Reclamation.

payment requirements, and increased its legislative safeguards to sound development in several important respects. Terms of payment have become more and more lenient, the sources from which payment can be drawn have been broadened, more thorough investigations have been stipulated, the advantages of multiple purpose projects have been recognized and the allocation of joint costs to their several purposes has been authorized.

With regard to payments, the Act of 1902 authorized the Secretary of the Interior to determine the charges per acre of land with a view to returning to the reclamation fund, in not to exceed 10 annual installments and without interest, the estimated cost of constructing the project.⁵

Before many years, however, a considerable number of projects had failed to meet the schedule of construction charges set up under the 1902 Act. In 1914 all accrued charges were placed in the construction fund and a new start was made under a 20-year repayment plan.⁶ Extension of the repayment period helped, but did not solve the delinquency problem. A few years after the close of World War I many contracts were again seriously in arrears. Congress then provided that all construction charges should be payable in annual installments based on the productive power of the land. The period of payment under this plan was indefinite but originally it was expected to run not more than 40 years. Determination of gross value of crops led to disputes and administrative difficulties, and provision for such contracts was repealed in 1926, but twenty of the irrigation districts which entered into this type of contract with the United States were still paying on this basis in 1947. The Act of 1926 authorized the Secretary of the Interior, upon request of individual waterusers or districts,⁷ to amend any existing water-right contract so as to increase the period for repayment of construction charges not to exceed 40 years from the date of the first payment under the original contract and also to make new contracts with up to 40-year repayment periods.⁸ The 40-year repay-

⁵ The Reclamation Act, Section 4.

⁶ Reclamation Extension Act, Section 2.

⁷ Contracts for payment of irrigation construction charges during the early period were made with individual land owners and homesteaders. Such contracts are still in force on a few projects, but by the Act of May 15, 1922, contracts with regularly organized irrigation districts were authorized. Since then contracts with organized irrigation districts rather than with individual landowners have become the general practice.

⁸ Sections 45 and 46 Omnibus Adjustment Act, 1926.

ment period is still in force but repayment has been modified in other ways which in effect lengthen the repayment period.

The Reclamation Act of 1939 provides for a development period of not to exceed 10 years before the beginning of the 40-year repayment period, thus extending the period of interest-free money to 50 years.⁹ Moratoria granted under special acts during depressions have increased the average contract life by approximately 10 years, according to a recent report by the Bureau of Reclamation.¹⁰

The Reclamation Act of 1939 also permits construction costs to be separated into two parts; (1) those incurred to provide facilities for furnishing the water supply—the main dams, reservoirs, pumping plants and carriage canals; and (2) those incurred for the water distribution system—secondary canals and laterals. Costs of the distribution system are to be paid for under the regular 40-year plan after a development period of not more than 10 years. With regard to water supply features, the Act authorizes water rental contracts with charges sufficient to cover annual operation and maintenance costs of the water supply works, plus a payment on construction costs to be determined by the Secretary of the Interior. These contracts may be short or long, but they may not exceed 40 years. At the expiration date new contracts presumably would be negotiated. Water users or irrigation districts establish no definite water rights under water rental contracts, whereas under repayment contracts permanent water rights are established.

Long repayment periods have been criticized on the grounds that they prevent farmers from accumulating equities in their farms. If construction payments drained off the total surplus above current operating and living expenses, this would be true. The Government, however, has demonstrated neither the ability nor the desire to do this. In determining the waterusers' ability to pay under re-

⁹ Section 7(b) Reclamation Project Act, 1939.

¹⁰ *How Reclamation Pays*, U. S. Dept. of Interior, Bur. of Reclamation, 1947. This publication reports that at the end of 1946 the repayment periods for 66 projects or major divisions of projects involving 177 contracts were distributed as follows.

Number of projects or major divisions	Repayment period (Years)
15	26-39
26	40-49
12	50-64
6	65-79
4	80-99
3	100-150

negotiated contracts, a reasonable return on investment, including normal land values, is included in current operating expenses. This provides a source of savings or capital accumulations for the owner-operator. It is not uncommon for land values to be maintained on projects which are in arrears on the payment of construction charges. Delinquency on water charges, therefore, is by no means conclusive proof of financial distress on the part of the water-users.

Delinquencies on construction charges are not large. The total due to June 30, 1948, was \$84,659,231.71, of which only \$2,369,020.66 (three percent) was unpaid. Delinquencies are kept relatively low, in part, through renegotiation of contracts with projects which are in arrears. Amendatory contracts are being made for projects which now have substantial uncollected items. One aspect of present negotiations is the reduction of annual installments through extension of the repayment period without reduction in the total obligation to be paid.¹¹ The usual reason given for default in payment is that the annual charges are in excess of the district's ability to pay. However, in some cases, there probably is an appreciable element of unwillingness as well as inability to pay. Undesirable features of contracts also may have contributed to delinquency. Virtually all of the earlier contracts provided for fixed annual payments without regard to fluctuation in economic conditions or to changes in the waterusers' ability to pay. Some projects were assessed on substantially more acres than were irrigated, others were authorized under 40-year repayment law with the informal understanding that the ability to repay in 40 years should be thoroughly reviewed before construction payments started.

Contracts are now renegotiated on the basis of detailed investigations by the Bureau of Reclamation regarding the district's ability to pay both operation and maintenance costs and construction charges under expected future average conditions. These contracts usually contain some formulae for adjusting the annual installment

¹¹ An exception is a recent contract on the Tucumcari project which writes off construction charges in excess of the estimated amount that can be collected over a 40-year period. Congress also has written off all the construction charges for five small reclamation projects (approximately \$3,325,000). Four of these were started in the early years in advance of adequate investigations and under pressure. Somewhat more than \$14,000,000 has been written off other projects primarily because of reclassification of land and the suspension of the poorer lands from paying status. Although some adjustments stemmed from the depression of the thirties which also caused substantial adjustments in other kinds of agricultural debts.

on construction charges in accordance with changes which may occur in farmers' dollar income and in the purchasing power of this income. Increased attention also has been given to the effect of differences in soils, topography, climate, markets, and other factors on the waterusers' ability to pay construction charges. Some recent contracts, such as those with the Columbia Basin Districts, allow for full recognition of these factors. These contracts specify differential construction payments. During the 10-year development period, water rental charges in Columbia Basin are to be graduated in accordance with the estimated productivity of various grades of land to produce net income under average management.

The desirability of adequate investigation prior to construction of projects was emphasized by the Fact Finders who stated that "success can come to future Federal Reclamation ventures only if projects are authorized upon a thoroughly scientific consideration of the probable power of the project to enable the farmer to repay construction costs and to win a living from irrigated lands. Community and political demand to secure projects," they said, "should be considered only after full knowledge of the feasibility of a proposed project has been secured."

Congress, in 1924, declared that no new project or new division of a project shall be approved for construction until detailed information is secured concerning the water supply, the engineering features, the cost of construction, land prices, and the probable cost of development, and until a finding is made in writing that it is feasible, that it is adaptable for actual settlement and farm homes, and that it will probably return the cost thereof to the United States.¹²

A showing of feasibility and of probable return of costs to the United States had become increasingly more difficult: (1) because new developments have had to turn to more difficult and costly projects as the lower cost and more advantageously located sites became utilized; (2) because great and disproportionate increases in construction and development costs have occurred; (3) because thorough investigation itself costs something but especially because such investigations by close examination often disclose additional obstacles to be overcome which involve increased costs. Detailed land classification, for example, usually eliminates some land which would be classed as irrigable in a reconnaissance survey.

¹² Subsection B, Section 4, Second Deficiency Act, 1924 (Fact Finders' Act).

In supporting their recommendations for sound policies and full investigation before approval of projects, the Fact Finders noted that in many cases the cost of works built by the Government was more than \$100 per acre. They quoted the testimony of the Chief Engineer of the Bureau of Reclamation to the effect that he knew of no new project where water could be provided at less than \$100 an acre. They also observed, as has often been done since, that "construction costs are in almost every instance larger, in some cases several times larger, than original estimates."

On the Columbia Basin Project the present estimated construction cost of irrigation works, including irrigation's share of the Grand Coulee Dam and reservoir is approximately \$410 per acre of irrigable land.¹³ Very preliminary estimates for the Missouri River Basin Project indicate an average cost of around \$400 per acre for the project as a whole. Cost varies widely among units of the project. For California's Central Valley, approximately \$253,000,-000 of construction costs are allocated to irrigation. The project, as presently authorized, will provide a full water supply to 542,000 acres and a supplemental supply to 510,000 acres. Assuming supplemental water supply at half of the full supply, this would be equivalent to a full water supply for approximately 800,000 acres at a cost of around \$300 per acre.

Water users generally are reluctant to obligate themselves to repay such high costs even though payment is over long periods and without interest. Often it would not be to their economic advantage. Ways of relieving waterusers from the full burden of construction costs have been sought in various directions. Four states—Colorado, New Mexico, Nebraska and North Dakota—have legislation providing for organization of Conservancy Districts authorized to levy and collect property taxes. Levies are made in proportion to the estimated benefits accruing to the property from irrigation developments. The most fruitful means of lowering waterusers' obligations thus far devised, however, is to use power revenues to help pay for irrigation works.

The law requires rates for Federal power to be at least sufficient to cover current operating expenses, plus not less than three percent annual interest on the unretired investment in power facilities, plus such fixed charges as the Secretary of the Interior deems

¹³ On the assumption that 1,029,000 acres will eventually be brought under irrigation, and exclusive of irrigation's portion of \$191,000,000 unallocated costs.

proper. It is the policy of the Department to set these fixed charges so that power construction costs will be returned in not less than 50 years. The interest component on the power construction costs is applied to help retire the cost of irrigation works on a number of projects. If prospective rates and sales of power are such that revenues will be more than sufficient to pay operating costs and interest, and to retire construction costs in 50 years, the surplus revenue from power may be applied to repayment of irrigation costs.

On the Columbia Basin Project, for example, it is estimated that at two mills per kilowatt hour, power revenues will result in large surplus revenues that are to be used to retire irrigation construction costs. The \$410 irrigation cost per acre is expected to be retired roughly as follows: interest component on construction costs, 20 percent; surplus power revenue, 60 percent; and water users, 20 percent. The portion of irrigation construction cost which is to be repaid by water users on the Central Valley Project is around 22 percent—on the Missouri River Basin Project around 23.

The use of power revenues to retire part of the irrigation construction costs has been authorized only for individual projects which have both power and irrigation features. These include some very large projects. There are, however, potential irrigation projects on which no opportunities for surplus revenue-producing power facilities occur. The Columbia River Basin Project report states that many irrigation projects awaiting development in the Basin have no opportunities for power production directly associated with them. Without the assistance of power revenues the report finds that these irrigation projects cannot pay the reimbursable costs. By contrast, however, potential main-stem power development will have repayment capacities far above their reimbursable costs. The report argues for authorization to pool surplus power revenues to help pay irrigation costs on any irrigation project or feature where needed in the entire Columbia River Valley. This authority would appreciably increase the number of irrigation projects which could meet feasibility and repayment requirements because large power revenues would be available to cover high-cost irrigation works.

Substantial aid to findings of feasibility and repayment of reimbursable costs has been achieved by Congressional broadening of nonreimbursable benefits from multiple purpose projects. Present

national policy is to require that construction costs allocated to irrigation, municipal, and industrial water and to power be repaid, whereas costs allocated to flood control, navigation, and fish and wildlife conservation are not. By national policy these latter items are recognized as "public benefits" and therefore are nonreimbursable, although a fully satisfactory explanation as to why benefits from keeping excess water off a river bottom farm are public benefits and therefore wholly nonreimbursable, whereas the benefits from taking surplus water to an arid bench farm are private benefits and therefore wholly reimbursable, has never been brought to my attention.

Bills are now before Congress which, if passed, will recognize additional purposes as nonreimbursable items under multiple-purpose projects. These include salinity control, sediment control, recreation, improvement of public transportation, and promotion of national defense. It is proposed that these measures be adopted not only to improve the feasibility and repayment prospects of projects not yet authorized, but also to reduce the repayment burden on water users and power revenues on projects already built or now under construction.

That the water user is not the sole recipient of benefits from irrigation development is receiving ever wider recognition. Persons engaged in servicing, processing, merchandising, transportation industries, and other pursuits within the immediate area and also in other parts of the country frequently are directly benefited. Various indirect benefits are nation-wide. Methods by which direct payments on irrigation costs might be obtained from beneficiaries other than water users have been sought without great success. Conservancy districts have helped to a limited extent. Power users may contribute indirectly if the use of power revenues to pay irrigation construction costs results in higher power rates than otherwise would have been charged. Present efforts to spread costs widely and thus lighten the allocation to irrigation are in the direction of placing a larger portion of costs in nonreimbursable categories. The legislative trend appears to be heading in the direction: (1) of using power revenues to repay costs of irrigation works; (2) reducing construction costs allocated to irrigation or placing them in the nonreimbursable class and (3) of finding irrigation feasible if there is reasonable assurance that farmers on the least productive irrigable lands will be able to pay average operat-

ing and maintenance expenses, once the irrigation works are constructed.

How much Federal subsidy should go into the building of irrigation works? A sound appraisal of this problem becomes increasingly urgent with mounting construction cost per acre of irrigable land as more difficult projects are undertaken, with relatively lower net benefits per acre as irrigation is extended to less promising localities, and with reduction in the proportion of the cost to be repaid by waterusers. The insistence of local pressure groups for project construction increases as payment allocations to local groups diminish.

The question of how much public investment should go into irrigation works does not lend itself to a direct or simple answer. Its answer is related to those of numerous other questions concerning national policy. How much of the national income should be spent by the Federal Government? How much of this should be used for the conservation and development of resources? How do prospective returns or contributions to national well-being from investment in irrigation works compare with those from investment in other lines—in development of metals, ores and minerals, in power facilities, roads, research, education, health, and wildlife conservation? Public and private benefits flow from all of these programs. All may be proper functions of Government, but all cannot be supported to the degree their more ardent advocates desire.

There is need for a well-rounded forward-looking national program of resource development and conservation. Construction and development of each part of this program should be geared to immediate and long-time national needs, to Government fiscal policy, and to general economic conditions. Contributions of each to the national welfare should be evaluated in terms of broad economic and social objectives. Irrigation development in my opinion, should have an important role in such a program.

ACREAGE LIMITATION IN FEDERAL IRRIGATION PROJECTS WITH PARTICULAR REFERENCE TO THE CENTRAL VALLEY PROJECT OF CALIFORNIA

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FOR the past several years the acreage limitation feature of federal reclamation law has been in controversy in the Central Valley Project of California. The issue arises primarily because this project deals with privately-owned lands, a good portion of which is already developed under irrigation and is in large ownerships and large operating farms. The project is needed to supplement presently inadequate water supplies and to integrate the uses of the water resources of the entire Central Valley Basin. No acreage limitation was contained in the state legislation of 1933 which originally authorized the project. But the state did not build the project; rather, the assistance of the federal government was sought and in 1935 it was authorized as a federal project subject to reclamation law. Since the people of the state had had little previous experience with federal reclamation, they had little reason to be well acquainted with reclamation law. Only in 1943 and 1944, when construction was well advanced, did landowners become generally aware of the acreage limitation. In the first several years following the initiation of the project, the Bureau of Reclamation, although it clearly should have done so, made no attempt to contract its prospective water supplies nor forthrightly and officially to inform the people of California that all provisions of federal reclamation law were applicable.

Much of the discussion as to the applicability and merits of the acreage limitation within the state and in Congress has been highly controversial. Prominent persons and organizations are lined up on one side or the other.¹ Unfortunately, the controversial atmosphere has obscured some all-important and fundamental problems and has delayed study and consideration of them. Inevitably, both proponents and opponents of the acreage limitation have had to assume extreme positions. It may perhaps truthfully be said that the acreage limitation as it now stands has neither the virtues

¹ For an excellent discussion of the political issues and the positions of parties in respect to them, see Taylor, Paul S., "Central Valley Project: Water and Land," *The Western Political Quarterly*, University of Utah, vol. 2, no. 2, June 1949.

that its supporters ascribe to it, nor the diabolical attributes that its foes ascribe to it.

Purposes of Acreage Limitation

The quarter section (160 acres) has long been a prominent feature in American land policy. Under the Pre-emption Act of 1841, an applicant could file a claim within the limit of 160 acres if he were the head of a family, or a man over twenty-one years, or a widow, but such applicant had to swear that he had no more than 320 acres of other land. Under the Homestead Act of 1862, any single person over twenty-one years, or any person who was the head of a family could acquire title to 160 acres of public land provided he met the residence and improvement requirements. These basic 160-acre limitation features were carried forward into the Reclamation Act of 1902, with the additional power conferred upon the Secretary of the Interior to adjust the limit in an ownership that would be eligible to receive federal irrigation water between the maximum of 160 acres and a minimum of 40 acres. Such a limit was to "represent the acreage which, in the opinion of the Secretary, may be reasonably required for the support of a family upon the lands in question . . ." (Sec. 4 of the Act of 1902). Thus, it appears that the framers of reclamation law intended not only to carry forward the maximum ownership concepts of the Pre-emption and Homestead acts but also to introduce further limitations to reflect differential productivities of land and the value of federally developed irrigation water—these considerations being further equated to the income needs of a family.

In irrigation law and philosophy, the acreage limitation has been expected to serve the dual and mutually consistent purposes of being a formula for the broad distribution of publicly financed benefits and an instrument of achieving family-owned and operated farms. It has been and continues to be expected that the ownership unit and the farm operational unit are one and the same thing, and that the owner will be the operator of his unit and no other. But apart from the determining of income needs and the unit to meet them, there are several problems here: one is in the aggregation of individuals that may constitute the family; another lies in the question of whether the owner will work his land or lease it to another; still others lie in the disposal of privately-owned lands in excess of the eligible acreage.

The basic reclamation statute is now almost a half century old. It has been amended and supplemented at least a dozen times in general legislation and additionally in legislation specific to individual projects. The vast detail of 47 years of legislative, administrative, and judicial experience incorporating the adaptations and concessions made in particular projects contains both affirmation of and divergence from apparent original legislative intent. Although acreage limitation as a general proposition has remained intact, many details as to its application have been changed both legislatively and administratively. As a result, the sort of farm unit now eligible to receive federal irrigation water differs materially from the unit as originally contemplated.

In summarizing the characteristics of the eligible irrigation unit as they were first conceived and in comparison with the provisions and administrative interpretations of current law, the contrasts are as follows:

Ownership Unit: Originally, as under the Pre-emption and Homestead acts, it was essentially a family concept with the rights resting in the head of the family or in a person over twenty-one years having the prospect of becoming the head of a family or a spouse of the head; the individual had to be a real person. Now the ownership unit is any person, without regard to family status, male or female, of any age, real or corporate.

Acreage Eligibility per Ownership Unit: Originally, based upon determination of the Secretary of the Interior of the amount of land needed to meet the income needs of the family, the acreage per ownership unit was set between 40 acres and 160 acres. Now, eligibility is 160 acres for any individual ownership, without regard to the productivity of the land or the income needs of the ownership unit.

Occupancy and Operation: Originally, the individual holding the water right was required to occupy the irrigation unit and live thereon or within a fifty-mile radius. Now, there are no residence or occupancy conditions whatever.

Disposition of Excess Land: In the early administration of the law, water was delivered only to units small enough in total to meet the eligibility requirements. This meant that if a holding was too large, the excess land had to be disposed of before water was supplied to the nonexcess. Now, any individual owner is entitled to water for 160 acres even though he may own 10,000 acres within a

project. Furthermore, water may be received on the entirety of an ownership, irrespective of how big it is, for ten years provided the owner enters into a contract agreeing to dispose of the excess within or at the end of the ten-year period.

With the changes that have occurred as to ownership, occupancy, and the disposal or nondisposal of excess land, it is quite apparent that the operating farm unit may differ very greatly from the irrigation eligibility unit. The operating unit may now include the irrigation acreage limit of each of any number of individuals holding fractional interests in co-tenancy plus excess lands either with or without project water plus any number of absentee ownerships that may be rented and brought into the operational unit.

The maximum divergence between original objective and possibilities under current reclamation law has not been manifest in other projects. Partly, this is for the reason that many of these projects were initiated under earlier law; partly, it is because several of them are covered by more restrictive legislation specific to the project. But more important, most of the projects are located within areas where the scale and type of farming is more nearly in accordance with the characteristics of the traditional family farm than is the case for much of the prospective irrigation service area in California. Here, the many large ownership and operating units already developed into intensively cultivated irrigation farms will quite obviously be subjected only to the minimum accommodation to the acreage limitation that is required under the law. Reciprocally, therefore, the widest divergences from original intent will undoubtedly come to be seen in the application of the limitation in the Central Valley Project.

Application of the Acreage Limitation to the Central Valley Project

The possibilities of setting up operational units much larger than the individual irrigation limit of 160 acres were described above. To what extent will owners and operators in the Central Valley area take advantage of these possibilities? This question obviously cannot be answered in advance but practices of the past should give some indication of the general characteristics of the situation that will come to prevail in the future.

Practices established in the past are indicated by a survey made in 1945 by Edwin Wilson and Marion Clawson, then of the Bureau of Agricultural Economics, of the interrelationships between

ownerships and operating units in the valley floor area of Madera, Tulare, and Kern counties,² which is the principal prospective water service area. The data were derived from AAA records which relate to the year 1940. This survey covered a total of 10,436 farm operating units for which the corresponding number of ownership units was 12,941, or an over-all ratio of $1\frac{1}{4}$ ownership units per operating unit. On one half of the ownership units, ownership and operation were perfectly concurrent, i.e., the owner farmed his own unit, renting no land to or from others. Tenants operating the entirety of an ownership but owning or renting no other land accounted for another 10 percent of the ownership units. Thus, a total of 60 percent of all ownership units was also the operating unit. But these arrangements were heavily confined to the smaller ownerships and, therefore, accounted for only a small fraction of the total land in farms.

With ownerships above 320 acres, the extent of identity between the ownership and the operating unit declines as size increases. From around 640 acres and up, the evidence is that owners become more concerned with renting than with operation.

Of all land in the operating units above 640 acres but less than 5,120 acres, more than half is rented. From 640 acres to 1,280 acres in operating farms, 57 percent is rented land; from 2,560 to 5,120 acres, 66 percent is rented, but the very large operating units over 5,120 acres are based primarily on owned land.³

The study included fifty-one farms which operated between 2,560 and 5,120 acres, of which only ten were based upon a single ownership, twenty-six were operating from two to ten ownership units and fifteen were operating more than ten ownership units.⁴

If, in the future, the practices of the past as revealed by the study of Wilson and Clawson are continued, the operational unit receiving federal water may quite well be several times the individual ownership limit. A community ownership of 320 acres, if added to by leasing land in the same ratio as now prevails for this size group, can be built into an average operatorship of approximately 600 acres. A unit combining the individual ownerships of a man and wife and two children and adding the average ratio of

² U. S. Bureau of Agricultural Economics. *Agricultural Land Ownership and Operation in the Southern San Joaquin Valley*. Berkeley, 1945. 100 p. Processed.

³ *Agricultural Land Ownership and Operation in the Southern San Joaquin Valley*, op. cit., p. 71.

⁴ *Ibid.*, p. 72.

rented land applicable to this size group could be built into an average operatorship of approximately 1,500 acres.

The practice of using rented land from several ownerships to build up large operating units is thus well established in this area. Beyond the possibility of combining ownerships, there are the additional opportunities of continuing to operate the excess acreage without project water or of operating the entire acreage for ten years with project water, received under a recordable contract. The combined effect of these possibilities of operating farms far in excess of the individual acreage eligibility cannot be forecast at this time. There seems to be no good reason why multiple leasing will not continue under federal irrigation, but the extent to which excess acreage will be kept in the operating unit, either with or without water, cannot at present be known. This is because only a small proportion of the total water supply is presently under contract and until all water is contracted, the project service areas will not be known, and until the project service areas are known, the amount of excess land cannot be known. Furthermore, whether the holders of excess land will want to operate it without water or will sell without having established water right, or will apply for project water under the recordable contract are decisions they will probably defer until the change in ground water levels and the assessment practices of the districts with respect to acreages not under service are known or can reasonably be forecast.

Although there are factors yet undeterminable that will influence the effect that acreage limitation may have on the size of operating units, there is little prospect that operating units will be restricted to anything like the individual irrigation limit of 160 acres. Apparently, there will be considerable opportunity to maintain federally-irrigated operating units of from 320 to 1,000 acres without much difficulty. Adding to that such excess lands as may be permanently retained without project water further increases the operating unit. It seems most doubtful, therefore, that the acreage limitation as such will contribute significantly towards the expansion of family-size farm units in the Central Valley Project area.

Conclusions

(1) Present law on acreage limitation—while being in broad terms the result of affirmation and reaffirmation, legislatively and administratively, of the initial act of 1902—now diverges in details

of such importance as to impair the realization of the objectives originally hoped for.

(2) At least in projects where private ownerships are large or other conditions are favorable to large-scale farming, the basic law cannot be expected to serve as a means of achieving family owned and operated farms. This does not mean, however, that supplemental legislation for specific projects prepared in advance of construction cannot be the means of realizing this objective.

(3) As long as tax-supported federal irrigation activity involves subsidy and originates benefits that are privately realizable by only a very minor proportion of the population, some sort of formula for the equitable distribution of such benefits is clearly needed. Although the per-capita benefit that can be realized has unquestionably been greatly increased during the past forty-seven years of legislative and administrative experience, and eligibility has shifted from the little fellow to a per-capita basis, the acreage limitation still stands as a formula for the broad distribution of benefits. For the Central Valley Project, the diffusion of benefits will apparently be realized less in terms of expanded opportunities to own and operate farms than in terms of opportunity to acquire and retain land on a rentier basis.

DISCUSSION

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Dr. Fuller's paper comprises a good statement of the operation of land tenure under the acreage limitation clauses in the Reclamation Act of 1902 and as subsequently modified. The purpose of federal irrigation activity as given by Dr. Fuller is subject to question. He stated the "primary purpose" of this activity "is to create farm homes on which the owning family will live and work and earn an acceptable income." This is a sociological objective. Back of the sociological objective and even more fundamental must be an economic objective: the creation of additional wealth-producing properties. Why should not consideration be given to an ownership or operation pattern that will bring most production or most wealth to America? Such a pattern would ensure earliest repayment.

In another part of his paper Dr. Fuller states "... that while federal irrigation law is now stripped entirely of the concepts of a family holding and an economic unit capable of providing a family income, the legislation for specific projects ... may contain limitations incorporating both ideas." The reader should note that the so-called minimum economic unit to which reference is made is "economic" only in the mind of a sociologist. A minimum economic unit more sound from the standpoint of society comprises that sized farm which will keep the operator fully occupied, or in other words which will utilize the full physical and managerial capacity of the operator. Incidentally, this latter minimum unit is the more readily determinable

and it is this unit which is becoming larger as mechanization and specialization develop.

In his closing remarks Dr. Fuller implied that the acreage limitation through its control on sales prices of excess land may reduce "speculation based upon the unearned irrigation value increment." It appears, however, that unless land is appraised and acquired by government before irrigation development is started, the original owners of the land, both large and small, will be the recipients of the largest unearned increment of value because of the enhancement of value before sale.

Mr. Selby in his paper has challenged the importance of irrigation in the economy of the West. His most extreme statement minimizing the value of irrigation follows: "the net result of additional irrigation development is chiefly more production of beef cattle and sheep than otherwise would occur." While it is conceded that irrigation development has made possible certain increase in the poundage and in the finishing of livestock produced in the West, to attempt to convert the net result of additional irrigation to pounds of beef and sheep is certainly a great simplification of the vast irrigation development that has occurred in the West.

Actually, in the twenty years ending with the year 1940 during which irrigation expanded widely, sheep numbers by census count decreased six percent in the eleven western states and numbers of beef cattle decreased 15 percent. It is not logical to take a matter like irrigation development entirely out of its setting. Irrigation development must be considered as a part of the development of the West. Here a new empire has been created. The same initiative, energy and capital that built the cities of Los Angeles and Seattle, that built the San Francisco Bay bridges, that built Grand Coulee, Bonneville, and Hoover dams, that developed the copper mines of Arizona, the coal of Utah, the ferrous and gold mines of Colorado, also built the irrigation works, leveled the land, and made the desert blossom with something other than cacti.

True, there might still be an America without Bonneville, without Los Angeles, without the Bay bridges, without the pleasure highways of the West. America in 1949 could import its copper from Mexico and South America. It might get its fruits and vegetables from Central America. For the love of nature its people might travel the highways of France and Italy and Switzerland. Under such conditions the production and industries of the West would not be competing with the production and industries of the eastern states—but that America would not be the world-dominating America we know at the midpoint of this twentieth century.

DISCUSSION

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The typical Midwestern attitude toward the increasingly costly reclamation projects in the West can be, I think, summarized in a few words. The attitude is changing. Typically, the people of the Midwest and the East believe in the conservation and development of our national resources including water. However, they have been familiar only in a general way with the scope, benefits, and costs of western reclamation projects. Frankly, they have been rather apathetic toward the entire question of irrigation of

western lands. Moreover many of them have sort of had the feeling that many of the products of irrigated lands in the West were supplementary to the staple agricultural products of the Corn Belt, such as out of season fruits and vegetables which move East in great volume.

Two recent developments are changing the typical attitude of the Midwest and the East toward further irrigation at federal expense. First the increasing federal tax burden paid by all of us, including Midwestern farmers, is causing many people to take a second look at large items of federal expenditure, especially where no direct benefits accrue to the person so aroused. The second development, which is upon us now, will really arouse a flood of protests in a year or so. Our farmers and our farm leaders, and a few college personnel also, will not welcome curtailment of output by government fiat in an area of natural production where water comes free, while at the same time they are being taxed to expand output in unnatural and high cost areas. And these Midwestern farmers will be further aroused when they discover that the net effect of much of the new irrigation in the West will be to increase output of competitive products such as livestock and dairy, as Mr Selby pointed out in his paper.

The Midwest, or any other section for that matter, has no quarrel with reclamation that pays a reasonable share of its way. After all, all sections of the country have had, and now have, considerable government enterprise of this nature. This was a basic principle of the original Reclamation Act of 1902. However, when reclamation becomes an end in itself, on projects that are obviously marginal, to state it generously, from a cost analysis point of view, then we need a new look at the entire process.

We have moved a long way from the subsidy provided in the Act of 1902, namely that project costs were made repayable without interest charges, to the philosophy currently held by many proponents of reclamation that an irrigation project is feasible if there is reasonable assurance that water users will be able to pay annual operating and maintenance expenses, with no charge for construction, as pointed out by Mr. Fuhrman.

It is deplorable that we tend to allocate an ever increasing share of irrigation costs against such non-reimbursable items as flood control, recreation, wild life and game development, and the like, in order to justify another irrigation construction project. This type of subterfuge is usually not in the long time public interest, if it results in uneconomical expenditure of public funds and an unnatural allocation of our production resources in agriculture. If we are going to curtail output of food and fiber in our natural and low cost producing areas, then we should not at the same time resort to a form of public deception in an unrealistic cost allocation to justify huge federal expenditures in additional irrigation projects.

Let's be realistic. If the nation faces an actual food shortage, then by all means let us pursue aggressive programs to reclaim new areas, even at considerable federal expense. But if we are going to act like we already have too much food (and that's the way it looks now), then let us produce our needs as economically as possible, wherever we can.

Let's be consistent. Let's not make reclamation an end in itself, particularly in cases that are clearly marginal or submarginal, but let's make the agricultural part of our reclamation program subordinate to the overall food and agricultural policy of the nation.

WESTERN RANGE LAND USE AND CONSERVATION PROBLEMS

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SUPPOSEDLY, now is a time when conservationists are seeing "bogey men" under beds and in dark closets. I'm not going to ask you to peer into such places with me, but I do want to draw a word picture of certain trends in the western range resources, to discuss the economic factors in those trends, and to relate those trends to some significant changes in the operation and management of western stock ranches.

In the general picture, the western range is a declining resource. So definitely is this true that some parts of it can be written off, as having passed or as rapidly passing the point of feasible rehabilitation. This decline is evidenced at the one extreme by rapid and violent erosional destruction of range land and soils; at the other extreme by shifts in the native plant associations to a somewhat lower, though not necessarily less valuable, range plant ecology. In between these extremes we see some widespread displacements of native range plants by exotic range plants that are much less useful as range forage and as soil and moisture conservers. We see some significantly undesirable shifts in the native range plant life of some large range areas.

Some deny these important changes and say that we have not any appreciable decline in the western range resources. Those who express this belief point to the long run uptrend in our western population of range and pasture animals, to the trend of increased calf and lamb crops and higher weights of market animals, to the higher number of animals marketed in ratio to the stock cattle and sheep population, and to the USDA index of range conditions. I refer here to the range conditions report of crop and livestock estimates in the Department. These reports give no indication of a long time trend. By their nature, they could not be expected to do so.

Let's examine, briefly, these "refutations" of statements and beliefs that there has been considerable and widespread loss in western range resources.

Fifty years ago scarcely any of the beef cattle of the eleven western states could be classed as farm cattle. Now, more than half of them must be so classed. At the turn of the century, crop feeds and

protein range supplements were little used in the winter maintenance of range cattle. Now, these feeds account for three or four months of the year's feed and forage supply. Western range lands, excluding those lost to cultivation, now probably yield considerably less grazing than they did forty or fifty years ago. The increased use of crop feeds and the use of more efficient animals obscure this change in the resource, as far as livestock production effects are concerned. We must recognize, too, that for some types of range the livestock grazing use and the weights of the animals marketed may be well maintained for quite a period of years, while, at the same time, adverse changes occur in the soil-holding range plants and in the soils.

Now, let's have a look at some of the changes that have taken place out on the land in the decline of western range resources, and let's see how these changes in the resources have caused consequent changes in the economy of the stock ranches. In presenting this picture, let's use a concept of natural geographic regions of the West. These regions coincide, in a general way, with the main range forage types of the West.

Range resources of the Northern Plains, east from the Northern Rocky Mountains to the ninety-eighth meridian and south from Canada to the Platte River, are neither greatly changed nor much deteriorated, except for the "go back" lands that were once farmed. This is the only one of the main range types of the West that has not undergone widespread change through use. The reason for this is, principally, a relationship between the ecology of this range type and the economics of its use that favors moderate grazing. Heavy use of this range changes it from an association of the mid-grasses and the short grasses to a pure short grass type. The short grasses are sod formers and good soil protectors. Under heavy use the short grasses often form a dense turf that yields only a small growth volume of range forage, and that is seasonally unbalanced. The short grasses are the warm weather grasses, and the mid-grasses are the cool weather grasses that afford much of the spring and fall range growth.

Thus, we see that overuse of the Northern Plains mixed prairie range type brings a quick economic penalty, before the occurrence of any considerable range plant and soil losses. It doesn't pay to overgraze this range, and that situation is usually definite and obvious. Too bad that we do not have this favorable relationship

is a pen good range plant ecology and good ranch production overomics for the other main range types of the West, but we do rapi

Large land resources of the Central Plains, from the Platte Noer to the southern limit of the high plains in northern Texas, In'have an ecologic and use relationship nearly comparable with lase of the Northern Plains. However, the production possibilities at the Central Plains for grain sorghums, dry land corn, and winter hheat pasturage, have induced widespread adaptation of stock anching toward stock farming. As a consequence, good maintenance of the native grassland is of less economic consequence for many of the stock growers. Native pastures are overused and the short grass sod furnishes some summer grazing that fits in fairly well with crop feeds and pastures and serves as an "exercise ground" when the livestock must be out of the fields. However where the Central Plains range lands are used in ranches, the economics of their use is comparable with the Northern Plains. The favorable economics of moderate use is, however, somewhat less definite, since the cool weather mid-grasses are less important and the warm weather short grasses more important in the year's range forage production.

Southern Plains range lands have shifted rapidly during the past thirty or forty years from a grasslands appearance to a brushlands aspect, and from a predominance of cattle grazing to a predominance of sheep and goat grazing. This shift to sheep and goats has been especially pronounced in the Texas Edwards Plateau; also in the Trans Pecos parts of Texas and New Mexico. The total cattle population of Texas did not decline very much during the period of this shift, but the center of Texas cattle population has shifted eastward, out of the range country. Texas sheep numbers nearly tripled between 1920 and 1940, and this has been associated with the shift in the Southern Plains range type to brush, shrub and weed growth and a diminution of the perennial grasses.

Probably this shift in range plant association and the consequent change in ranch economy have not materially lowered the income of the ranches, for the present. But, loss of the perennial grasses as soil protectors has greatly increased the soil erosion problems of Southern Plains range lands.

Let's turn next to the Rocky Mountain Region, which lies between the plateau country to the west and the Great Plains to

the east. Range resources of this region consist mainly of the hill grasslands, of the bunchgrass cattle feed in the ponderosa zone of the mountains, and of the sub-alpine and alpine sheep of the higher mountains. Most of these resources are in a different trend of range plant ecology and soil conditions. For most of the region, however, the consequence of this trend in the range resource does not yet show up in changed ranch economics. As the perennial bunchgrasses have diminished from overuse, the livestock production has been fairly well sustained on the browse feed and on the annual grasses and weeds that are not good soil protectors. Soil erosion can, in this situation, reach an advanced stage before the livestock production and the ranch economics are materially lowered. This is the situation that jeopardizes the watershed land of much of the Rocky Mountain Region, the headwaters of the main streams of the West and the source of much of its water.

We look next at the range resources of the Intermountain Region, the region westward from the Rocky Mountains to the Sierras and the Cascades, and northward from the Mogollon "rim." Most important of the several range types of this region is the great sagebrush range type. It is greatly changed, and the economics of its use is changed accordingly. Once the sagebrush stands were open, with a good understory of the native perennial bunchgrasses. In its early use this range was, principally, cattle range. Much of it was good, season-long cattle range. Overuse for cattle grazing took out the bunchgrasses, the sagebrush stands thickened, and, throughout the eighty million or more acres of this range type, there is now an understory of the Mediterranean brome grass commonly known as cheat grass. This cheatgrass grows early in the spring and dries to a "fire tinder" by June. This change has made this range a spring range instead of a season-long range. It can be used for range livestock production seasonally, in the spring and early summer when the cheatgrass is green, if such spring range can be fitted in with other seasonal ranges, meadow grazing and crop feeds to complete the year's operation. The cheatgrass isn't much good after it dries. Many a cattle ranch has, because of this change in the sagebrush lands, had to reduce cattle numbers drastically and depend much more upon summer grazing of the ranch hay meadows.

In the more arid parts of this range type, such as southern Idaho and western Nevada, cheatgrass range fires are destroying the sagebrush, thus resulting in a pure cheatgrass stand. Cheatgrass

is a poor soil protector on erodible slopes, especially when burned over. Competent range conservationists say that they foresee a rapid trend to true desert conditions for much of this land.

Let's look at California range resources and ranching next. Northeastern California range lands are similar to those of the Intermountain Region, so we will confine our attention to the range lands that rim the California central valley—the Sierra foothills and the hills of the coast mountain ranges. Two important changes have occurred in the range resource of what is now known as the California annual grass range type. This range resource was once an association of native perennial grasses and native annual grasses. Now it consists entirely of annual grasses, native and exotic—the native perennial grasses now occur only in relic stands. In the upper or brush zone of this range type, range brush burning has caused accelerated soil erosion on much of the land in the brush zone.

Growth and use of the California annual grasses are highly seasonal, from November to June, or during the season of winter rains. Stocker cattle are imported in large numbers from nearby states to use this highly seasonal range grazing, and the breeding herd part of the ranch operation is maintained through the summer on the harsh, dry oat and brome grasses, with addition of a protein supplement to the range grazing. Perennial grasses, such as were once a part of this range type, would permit a larger breeding herd operation, with better summer grazing, and a decrease in the speculative purchase of stocker cattle to use the highly seasonal range forage of the annuals.

In the southwestern region, south of the Mogollon rim and between the Colorado River and the Rio Grande, we see a startling contrast between the desert shrub lands and some spectacular semi-desert grasslands in southeastern Arizona and southwestern New Mexico. These grasslands have remained in reasonably good condition.

We are told by competent ecologists, however, that the present southwestern desert shrub lands once had a grasslands aspect; that, before they were long overused they were in a period of soil formation and ecologic uptrend. Now, we see the rapid eroding out of the flat alluvial valleys and drainageways of the streams. An illustration of this is the rapid destruction of the lands of the Rio Puerco drainage, and the consequent high rate of sedimentation into Elephant Butte reservoir. Some of the "desert" lands of this region

that once supported reasonably good yearlong cattle grazing now can be grazed only with stocker cattle in the occasional winter and spring season when favorable precipitation causes the desert annual plants to grow in volume.

So much for our word picture of what is happening to western range resources and the consequent change in ranch economics.

Perhaps considerable loss in the western range resources should not be viewed as of too much consequence, nationally. All of the beef cattle on both the farms and the ranches of the eleven western states account for probably not more than fifteen to twenty percent of the total U. S. beef production tonnage. However, these states produce about a third of the feeder animals, nationally, that go into the feedlots. Probably the foreseeable loss in western beef production as a result of losses in range resources could be offset by some relatively minor changes in corn-belt agriculture.

Continued losses in western range resources will, however, be of real consequence to western economy. Consequences would be a materially lowered income from livestock, and, much more important, some far-reaching adverse effects upon western water resources. I wish to say more about that later on.

It seems probable that we are going to have the conditions for further and considerable loss in western range resources. Likely, we are going to have the profit incentive for carrying as high a number of beef animals as possible. Present prognostications regarding the increase in the human population of the U. S. during the next twenty-five years indicate that we may have need for a beef cattle population one-fourth greater than our past all-time peak. Beef is made mostly from grass. Grain feed accounts for probably not more than fifteen percent of the total U. S. beef production tonnage. Where will we find the increased range and pasture production for any such beef cattle production? Probably in part, by continued pressure on the western range resources.

One of the currently live policy questions in the use and conservation of western range resources is that of private versus public ownership, especially for the lands in Federal public ownership. One viewpoint concerning this issue is that overuse and mismanagement of the resource are more likely to occur on lands in public ownership because of insecurity of tenure and lack of management control by the grazing users. This viewpoint argues for private ownership of all lands used for grazing, perhaps excepting the lands

of multiple uses and significant public interest, on the grounds that the profit incentives of entrepreneurship will best conserve the range forage and soil resources. Corollary with this view concerning private ownership, it is said that for the lands of high public interest that must remain in public ownership, adequate security of tenure for the grazing users will give the needed economic incentives for maintenance of the resource through private entrepreneurship. We note here, as a matter of information, that the present ownership of the range resources of the eleven western states is approximately two-thirds private and one-third public. This is in terms of production rather than of acreage.

It is my belief that, until rather recently, there has not been any significant relationship between the kind of ownership and the good use of western range resources. Some of the best conservation has been on privately owned lands; some large areas long in private ownership have been badly used—the Texas Trans-Pecos District, for example. Until recently, numbers of livestock grazed on the public lands closely paralleled the trends of total western cattle and sheep numbers. Since 1940, however, the grazing of cattle on the western national forests has been reduced during the period of uptrend in western cattle numbers. This is in contrast with the period of the first World War, when nearly a million additional head of cattle were admitted to the national forests for grazing as a “war emergency measure.”

It seems probable that the most important causes of misuse and loss of western range resources are the economic influences and the lack of management “know how.” Most important among the economic influences I would rate the considerable lag between ecologic and economic trends, for most of the main range types; the wide production swings of an arid region and the tendency to base financial structure on the favorable periods; the problems of land tenure in good management, especially for the private lands.

Lack of management “know how” as a cause of loss in western range resources probably can’t be changed very rapidly. Meanwhile, we foresee the probable economic basis for continued use pressure on the western range resources. What are the possible policy and program alternatives for better use and conservation of these resources?

In thinking about these policy and program alternatives, let’s look first at the public lands. Principally, these lands are the 135

million acres of the national forest land of the eleven western states, and the some 180 million acres of the lands remaining in the public domain when the Taylor Act was passed in 1934. Since then, some 140 million acres of these lands have, under this Act, been included in Federal grazing districts.

National forests are, mainly, the western mountainous uplands. These lands are not all timbered: in fact, commercial timber resource accounts for less than half of their area. Timber, brush, shrubs and grass cover most of the western national forests. About half of their area is used for the grazing of domestic livestock.

Because of their watershed aspects, the western national forest lands are heavily fraught with public interest. These lands originate nearly three-fourths of the western water supplies available for agricultural, urban and industrial use in the arid West. Western mountainous uplands above 6,000 feet in elevation yield most of the water. Misuse of the upland watershed lands and consequent changes in vegetation and soils can greatly alter the hydrology of these lands. Surface runoff can be increased at the expense of the ground water storages, time of delivery of the runoff can be considerably changed, quality and useability of the water can be damaged by increased sedimentation.

Grazing use of these lands should be such as will not interfere with good watershed use. It might be argued that, with long-term and secure tenure for the grazing user, profit incentives in the grazing use and the maintenance of good watershed conditions would be coincident. However, for most of the national forest grazing, the usual calculations of production economics do not favor the maintenance of plant and soil conditions needed for good watershed management. Thus, we arrive at the conclusion that the grazing use of the western national forest lands must be constantly subject to review and revision by the administrative management agency, and that the grazing users must accept any changes needed for the watershed use and other uses of high public value.

The question has been raised whether the upsurge of western deer and elk populations during the past four or five decades has contributed materially to the grazing overuse of western wild lands. In localized situations this appears to be true, but it isn't very important in the general picture for the upland range resources. Deer and elk use many browse feeds not much used by the domestic livestock, and the deer eat browse in preference to grass. Much of

the upland summer range used by deer is too rough and inaccessible for range use by domestic livestock.

Somewhat in contrast with the national forests, nearly all of the lands of the public domain are used for the grazing of domestic livestock. These are lands of low grazing capacity—about six head of cattle per section or twenty-five head of sheep per section on a basis of yearlong grazing—and in the past they have been below the margin for investment in management facilities and payment of taxes by private ownership. Livestock prices and ranch earnings of recent years have lifted many of these lands, perhaps temporarily, above the margin for private ownership. As a consequence, there has been a considerable demand for policy and legislative changes to permit ready purchase of these lands by grazing users.

Some of these public lands have considerable value in wildlife and recreational uses. They are the winter and spring ranges for many of the western deer herds. These are not watershed lands in the sense of water producing lands, but some of them have become a subject of considerable public interest and concern as sources of sedimentation. As an illustration of this, it is estimated that the Rio Puerco drainage of the Rio Grande yields 60 percent of the sediment and only 10 percent of the water entering the Elephant Butte reservoir. Competent conservationists state that the arid lands of the public domain have, because of their erosion and sedimentation condition and potential, become the most important problem lands of the West, and that their grazing use must rapidly be subordinated to the necessary rehabilitation and conservation measures that are going to require heavy public expenditures in the general public interest.

For the conservation and good use of the *privately-owned* range resources of the West, we need a good program of educational and extension work in range management. In the Northern and the Central Plains, especially, such work should be closely associated with extension work in livestock ranch production economics, for in these regions it is generally true that range conservation pays dividends, within the time of ordinary foresight and usual business calculation. For most of the other regions of the West, extension work in range management must be closely integrated with the work of the conservation action programs that can use public funds for resource conservation in the general public interest. For here often the ranch production economics results of range land

conservation seem remote and uncertain, due to inherent factors of ecologic and economic relationships, or because the conservation problems have, in our past exploitative rural economy, outrun the capacity of individual entrepreneurship for investment and waiting.

DISCUSSION

WILLIAM N. ANDERSON
Bureau of Land Management

I must confess that Mr. Saunderson gave me quite a start when he said that our range resources have declined to the extent that some parts of them can be written off as having passed or as rapidly passing the point of feasible rehabilitation.

While the Bureau of Land Management has not yet written off any of its depleted areas as not feasible of rehabilitation, we are admittedly stumped for the present on what to do toward rehabilitation of much of our cheatgrass invasion where recurrent burning so far has defied prevention, where repeated burning means continued decline, and where reseeding by present means is not practicable. We are also stumped on what to do about widespread gully erosion in areas where direct structural treatment is financially out of the question.

These, however, appear to be problems of technique rather than cases where the range has deteriorated so far that it will not respond to treatment where treatment is feasible. For example, an area near Bliss, Idaho, was severely depleted for many years by heavy over-grazing and recurrent burning. Vegetative cover a few years ago declined to a point where wind erosion took over and dune formation began. Despite this advanced state of depletion, reseeding treatment reclothed this area and controlled the erosion in two years' time. This experience indicates that proper management and rehabilitation efforts should succeed in preventing declines to "true desert" conditions in this areas as long as precipitation continues at present normals.

Observations in grazing districts indicate that the rate of decline in the range resources has been at least slowed down, and in some areas the trend has been reversed. Nevertheless, still further large readjustments in livestock use must be made in order to entirely halt the decline.

A brighter aspect is seen in many studies which have shown that net returns to livestock operators commonly increase when numbers of stock on over-used ranges are reduced to a point permitting forage recovery. Once an upward trend is established, numbers may be again gradually built up. By careful management the restored range can be made to safely carry even greater numbers than those under which it is now declining.

Despite these favorable signs, I cannot subscribe to the view indicated by Dr. Vass that upward trends in western livestock populations demonstrate a continuing healthy condition of the range as a whole. The point is not clearly demonstrable from production analyses because of the lack of

comparable statistics over a sufficient time period. Many changes have taken place which make it impossible to arrive at conclusions as to the degree the range contributes to increased production. Much former range land now is in crop production; increased livestock populations are supported by these crop lands; present western livestock populations include large numbers which do not use the range at all and others that use it but little; range cattle now are generally sold at much younger ages than formerly, etc. On the other hand, the ecological evidences of decline in such areas as the Edwards Plateau of Texas and the Central Valley foothills of California, noted by Mr. Saunderson, and the similar evidences seen in the continuing increase in sagebrush density throughout the intermountain area, are too frequent and extensive to be dismissed as isolated examples.

As Mr. Saunderson has pointed out, the importance of this decline is not reflected in grazing values alone, but in all associated values. The erosion problem on the Rio Puerco and its effect upon Elephant Butte Reservoir is but one of many examples which might be cited. Proper use of watersheds is essential, whether to protect downstream values subject to damage by flood, sedimentation of water storage or to protect the water shed itself from erosion. The additional importance attaching to proper range use for its effect upon ground water percolation is emphasized by current problems of lowered ground water tables in areas where pump irrigation supplements surface waters to a large extent. The vast areas of public and private ranges doubtless contribute significantly to these ground waters, since they often absorb more precipitation than they shed.

I cannot agree with Mr. Saunderson's suggestion that "Probably the foreseeable loss in western beef production as a result of losses in range resources could be offset by some relatively minor changes in Corn-belt agriculture," and that this decline would be important only to the Western economy. Resource economists commonly point to greatly pyramided benefits to the general economy deriving from relatively minor increments to new wealth from primary production. Is it not reasonable to assume that a loss of basic productive capacity of similar scale would be equally pyramidal in its adverse effect upon the general economy? I do not feel that we can dismiss the western range economy as unimportant to the nation. Certainly we cannot dismiss as inconsequential the combined effects of direct range production losses and associated losses in irrigated agriculture, power development and other associated values.

There can be no doubt that the natural human tendency—or perhaps I should say to this group the natural economic tendency—to overstock the investment-free, tax-free public ranges while protecting privately owned lands has accounted for much of the existing depletion on public ranges. It should be observed, however, that the reasons for this practice have been largely removed under the permit system on National Forests and on grazing district lands. Much of the formerly abused public range is now in individual or small-group allotments. The users have essentially the same incentives for careful use as on owned lands. Even on unallotted, common-use ranges the unauthorized user has been virtually eliminated, so there is

no longer occasion for the dog-eat-dog tactics which prevailed in the days of the open range.

With an assured tenure on grazing district range lands, the range user is expanding his natural interest in conservation to cover his whole set-up, including the public ranges. He realizes that his whole operation is no stronger than its weakest link. Hard-earned gains made on well-kept private lands are quickly lost on run-down public lands which supply the forage for his stock for a certain season. With well defined national conservation policies governing the use of these ranges, it would appear that the greatest danger of overstocking in the future will be on privately owned ranges, where economic circumstances might compel the owner to over-use in an attempt to keep land investments liquid.

There is no particular magic in either public ownership or private ownership—each seems to have found its place largely on the basis of the management and development needs and the productive capacity of the lands involved. The general lack of interest of present range users in buying the public lands, seems to indicate that the division between public and private ownership may become permanently stabilized at about present levels.

DISCUSSION

H. R. HOCHMUTH

Bureau of Agricultural Economics

It is apparent that the problems of the range area are many. Some will say that overgrazing is the primary problem, others point to tenure, or climate, or government land ownership as of greater importance.

Although not specifically stated one gains the impression from Mr. Saunderson's paper that there can be no great separation between ecological and economic trends. These two sciences always closely associated when applied to the management and use of the range resource are factors contributing to the wealth of conflicting viewpoints. The concomitant effects of economic and physical pressures on the ranching environment are not easily isolated.

One can recall statements by conservationists that in general the range has trended downward in productivity since 1890. If that be true then the effects have been obscured by the insidious advance of breeding, irrigation development, and management. The producer has not been convinced of overall range deterioration. The calf and lamb crops are higher than in the past and the livestock market weights by age class are superior to anything previously obtained. And so the chasm between producer and conservationist widens. Actually it is a socio-political-physical problem.

If we could devise a means of indicating proper land use in terms common to all factions, progress would be more rapid. The producers think more in terms of food and fiber production and income than in terms of overgrazing and plant indicators. To prove (to the producer) that overgrazing is present, conservationists should present significant differences in net production of meat between overgrazed and properly grazed ranges. And these differences should be ascribed solely to the forage production factor. The effects of feedstuffs, animal husbandry, and other non-forage

factors should be eliminated. At that point we could then be on common ground and separate fact from fable.

Mr. Saunderson has been pessimistic to the extent that we get a broad picture of range deterioration and poor land management. Everywhere there are examples of range lands that indicate good land use and management. It would be desirable to study these lands as examples of economic use of resources. The negative approach to good land use has not occasioned the desired objective.

Where Mr. Saunderson feels that range deterioration is widespread, Dr. Vass finds no such indications for Wyoming. Dr. Vass is inclined to take the producer viewpoint that it is uneconomic for the rancher to overgraze, therefore, in the long run, he cannot afford to do so. However, the statement that the Forest service ranges should respond in the same manner as do private lands seems erroneous. The private ranges of the west lie mostly at the base of or between mountain ranges. These ranges, of course, do not include the extensive short grass areas of the plains. For the most part the National Forest areas are highly seasonal ranges with rugged topography. In all aspects of use, management, multiple use, climate, and forage production they have no comparability with private range—unless that private range is intermingled. Particular management factors not applicable elsewhere must be applied to the use and administration of National Forest ranges.

Tenure may have a greater import on the problems of range economy than does overgrazing. Perhaps there is reason to wonder why in our system of free enterprise some public lands exist that do not differ in any important aspects from adjacent private lands. If the federal government wished to dispose of them by sale would the users buy them—would they return the tax cost over lengthy periods through climatic and economic depressions?

It is a well established principle in public land areas that some of the value of public range forage is capitalized into private investment. This is due to at least two factors; (1) the scarcity of certain types of seasonal range, and (2) the economic rent from public lands which is capitalized into private holdings. This would indicate that perhaps grazing fees are less than the full rent from such land. Furthermore because our land taxing system is less than perfect, private lands comparable as to site and use are taxed in like ratio. But private lands associated with public grazing privileges have economic advantages not available to lands lacking public grazing privileges.

Calculation of the value of an animal unit month of forage is liable to misdirection if one computes only on a forage or TDN basis. If we had a perfect competitive system for obtaining forage from public lands then the question of proper allocation of economic rent between various land ownerships would be academic. The Ricardian theory of distribution and law of rent has extensive limitations when applied to land in the public range states. It is difficult, to say the least, to calculate the residual return to land—land that may have no alternative uses—when the return to that land is dependent upon use of and return from other parcels of land. A grazing animal recognizes no tenure relationships.

THE OBJECTIVES, EFFECTS AND COSTS OF FEED GRAIN STORAGE*

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THE United States Government has been conducting a feed grain storage program for nearly sixteen years—ever since the Commodity Credit Corporation was organized in October, 1933. We should be able now to appraise this program, and make recommendations for the future, in the light of specific experience as well as general economics.

In order to appraise the program properly, we need to know first what objectives the program was set up to attain, and whether they were appropriate objectives. Then we can match performance against objectives, and benefits against costs.

Objectives of Feed Grain Storage

The original objectives of the CCC storage program were set forth in a brief statement by Henry A. Wallace, then Secretary of Agriculture, in 1936. In his view, the chief purpose of the “ever-normal granary” was to stabilize supplies against variations in production due to good and bad weather.¹ The first Annual Report of the CCC, published in 1940, took in more territory. It listed “three fundamental functions of the Corporation’s loan program: Namely, to protect and increase farm prices, to stabilize farm prices, and to assure adequate supplies of farm products.”

Were these valid objectives for a storage program?

A storage program can't raise long-time price levels. It is obvious that the first objective is not valid. A storage program clearly cannot “increase farm prices” over a period of years. What goes into storage must eventually come out; and when it comes out, it will depress prices about as much as it raised them when it went in (if the demand curve is a straight line on arithmetic paper). A program to reduce production, or to destroy some of the production, can raise the level of prices over a period of years, but a storage program cannot.

A storage program shouldn't stabilize prices against variations in

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¹ The Agricultural Situation, Bureau of Agricultural Economics, U. S. Department of Agriculture, XX: 1, January 1, 1936.

demand. It is not an appropriate means for evening out the effects of variations in general demand. These variations in general demand, due to wars, depressions, booms, etc. do not last merely for a year at a time, to be followed by a new situation the next year, like variations in production. They may persist through most of a decade, like the depression of the 1930's, or they may be very brief. It is difficult to forecast when they will come and how long they will last. Nobody can tell in advance, therefore, how much to store nor how long to store it.

Furthermore, a storage program to stabilize prices against variations in general demand would have bad effects on low income and unemployed groups during a depression. It would accentuate the paradox of want in the midst of plenty. The government would be withholding food and raising food prices, against the interests of its consumers, many of whom would not be getting enough to eat.

A storage program however can stabilize prices against variations in supply. It can stabilize the farm prices of durable products against unpredictable variations in production due to weather. It can do this by putting the excess over average production into storage in big crop years, and taking it out in small crop years. That is the proper function of a storage program.

The question is whether we need a storage program of this sort for feed grains.

In order to answer this question, we need first to measure the variability of feed grain production, and then to show the effects of this variability on livestock production. This will provide a basis for measuring the effects of a feed grain storage program. Then we shall need to measure the costs of the storage program. The final step will be to compare the benefits with the costs.

Variability of Feed Grain and Livestock Production

The variability of the production of feed grains is shown separately by crops in Figure 1.²

Corn is by far the most important of the four crops shown. It makes up from 50 to 60 percent of the total feed concentrate supply. The greatest change in corn production from one year to the next took place from 1947 to 1949, when production increased 35 million tons—more than 1.2 billion bushels. The variations resulting from the drouth years of the 1930's were almost as great. "Year-to-year

² BAE Neg. 43928-X, Ag. Outlook Charts 1949, p. 31.

changes in United States corn production during the past 30 years (1919-1948) averaged 408 million bushels, or about 15 percent of the average production for the period (2,635 million bushels)."³

In one way, this quotation understates the variation, from a storage point of view, since corn production occasionally changes in the same direction for two or three consecutive years. The coefficient of variation⁴ about the trend over the period as a whole was 14.1 percent. This means that in a normal distribution, a band ranging from 14.1 percent above average production to 14.1 percent below average production—a total range of 28.2 percent—would include 68 percent of the series of corn crops. Also, a range from $14.1 \times 0.67 = 9.5$ percent above and below average production—a total range of 19 percent—would include 50 percent of the series of corn crops.

The next most important crop, oats, appears to be less variable than corn. But this appearance is deceptive, resulting from the smaller average size of the oats crop. Proportionally, the coefficient of variation for oats—16.1 percent—is greater than for corn.

The full impact of the variation in feed grains production upon livestock production is cushioned to some extent by offsetting variations in the carryover from year-to-year, and by variations in imports. Figure 2⁵ shows the feed concentrate supply (production plus carryover plus imports). The picture here is distorted a bit by the fact that government storage programs were in effect part of the time, reducing the variation in market supplies to some extent. Yet the coefficient of variation over the period shown was 13.4 percent, nearly as great as the figure for corn production.

The effects of this variation in feed concentrate supplies on total livestock numbers is shown by the dashed line in the upper part of Figure 2. Other factors also affected the numbers of livestock fed, for example, the war in the latter part of the period. But Figure 2

³ "The Feed Situation," Bureau of Agricultural Economics, U. S. Department of Agriculture, December, 1948, p. 11.

⁴ The coefficient of variation—the standard deviation divided by the mean—is used here, to enable direct comparisons to be made among the different series, independent of the units in which they are expressed. The deviations are measured from trends fitted by the method of orthogonal polynomials.

A curve of higher degree was used whenever its use brought a significant reduction in the variance. Linear trends were used for feed concentrates, hogs on farms, total livestock, and pork. Second degree polynomials were used for corn and oats. A third polynomial was used for total meat.

This job was done by Joe Boyd at North Carolina State College.

⁵ BAE Neg. 46500A-X Ag. O.C. 1949, p. 34.

shows that the controlling factor was the total supplies of feed. No matter how high livestock prices go, farmers cannot produce more livestock than their feed supplies will support.

The numbers of livestock fed annually are shown separately by species in Figure 3.⁶ The coefficient of variation for total livestock numbers was 6.7 percent. Hog numbers were the most variable of any species. Their coefficient of variation was 14.2 percent.

Total meat production varied a little more than total livestock numbers, as shown in Figure 4.⁷ The coefficient of variation in this case was 8.6 percent. Pork production varied more than other meats; its coefficient of variation was 14.3 percent. Milk production was relatively stable.

In sum, then: The variation in corn and oats production (averaging roughly from 10 percent above to 10 percent below average production) does not cause much variation in beef cattle production nor in milk production; but it does cause an equal variation (from 10 percent above to 10 percent below average production) in hog and pork production.

Effects of Stabilizing Feed Grain Supplies

The objective of a feed grain storage program should be to smooth out the variations in feeds production by storage operations, and thus smooth out the variations in livestock production.

This smoothing out would have two effects. It would affect the income of feed grain and hog producers, and it would affect the cost of producing hogs.

The demand curve for corn is a straight line on arithmetic paper, with an average elasticity of about -0.65 . Simple arithmetic shows that a storage program for corn, in effect converting large and small crops to average crops, would increase growers' incomes between two and three percent. (Details omitted here.)

Most of the corn crop, of course, is fed to livestock, not sold as cash grain. The demand curve for hogs, which are the principal consumers of corn, happens to have about the same elasticity and curvature as the demand for corn. A corn storage program that stabilized hog production would increase hog producers' incomes in the same way that it would increase corn producers' incomes if they sold their corn as cash grain.

⁶ BAE Neg. 46824-X, Ag. O.C. 1949, p. 35.

⁷ BAE Neg. 43812-X, Ag. O.C. 1940, p. 37.

A feed grain storage program would also affect hog production, processing, and distribution costs. Hog and pork production varies fully as much as corn production. Variations in production increase production and distribution costs. Equipment adequate to handle the peak load stands partly idle when production is low, and idle equipment increases per unit costs.

A full quantitative study of how much the variations in hog production raise costs is a farm management and distribution problem beyond the space limits of this paper. But earlier studies indicate that stabilization, especially stabilization that was assured in advance, would reduce hog production costs perhaps two or three percent. It would also reduce the costs of distribution.

Costs of a Feed Grain Storage Program

Corn is by far the most important feed grain crop. Oats is the second. It is cheaper to store corn on the cob than threshed oats. For these reasons, stabilizing corn supplies, with an allowance for oats too, would provide reasonably complete stabilization of total feed grain supplies at the lowest cost.

Complete stabilization of the market supplies of corn would hardly be practical. From 1870 to 1900, storage stocks of corn up to a billion bushels in size would have been large enough to stabilize corn supplies. During the decade from 1900-10, however, seven large corn crops occurred in succession, and the stabilization stocks would have increased to about two billion bushels. In the 1920's they would have grown larger yet, to nearly three billion bushels. Yet they still would not have been large enough to fill in the gap caused by the succession of four short crops from 1933-36 inclusive.

Drouths as severe and close together as those of 1934-36 have occurred only once in 80 years. It would be dubious wisdom to carry large stocks for 20 years or more in order to cope with drouths like these, especially since this would involve heroic extrapolation of stabilization base trends in a situation where everything else was unstable. If the years 1934-36 are excluded, stocks of a billion bushels would have been large enough to stabilize corn supplies.

An additional 100 million bushels of corn would take care of the variations in oats production. Feed wheat stabilization, a comparatively small matter, probably should be conducted in the western wheat feeding areas, close to the livestock where the need for it is greatest.

An additional quantity of corn should be stored to meet unforeseen short-time increases in demand. For military preparedness, a billion bushels would not be too much. But that is a military matter. Those stocks should be carried, if at all, on a military budget. We will stick to peacetime requirements here. For this purpose, a relatively small quantity—say two hundred million bushels—may be sufficient.

These minimum reserve stocks might also come in handy for another purpose. The stabilization stocks should not be drawn down to zero, even in a very short crop year, for the next crop may be short too. This happened in 1935 and 1936, after the very short crop of 1934. This is such a rare case, however, that it would hardly justify carrying reserve supplies for that reason alone.

The three items above add up to 1.3 billion bushels. Stocks amounting at their maximum to this figure would be large enough to do a reasonably good job of stabilizing the supplies of feed grains.

Study of Figure 1 shows that the distribution of corn crop sizes is asymmetrical. There is a tendency for several years of moderately good corn crops to come consecutively, followed by one or two severely short crops. Stabilization stocks usually would build up over a period of several years and then be drawn down at one swoop. The stocks frequently would need to be carried for as long as five years at a time. Stocks would have accumulated like this for several years, and then have been used up in one year, over several five-year periods in the past—from 1919 to 1924; from 1925 to 1930; from 1931 to 1936; and from 1942 to 1947.

In the preceding sections, we estimated that quantities of corn ranging from 200 million bushels minimum reserve up to 1,300 million maximum—averaging 750—would need to be carried, sometimes for as much as five years at a time, and frequently for two or three years at a time. The average length of time would be perhaps three years. Thus corn on the average would be carried for about three years, and dumped on the fourth. This would require carrying an average quantity of $750 \times \frac{4}{3} = 562$ million bushels of corn annually.

Before World War II, the estimated cost of storing corn on the farm was about half a cent per bushel per month, or six cents per year. The CCC paid farmers five cents a year for several years, then seven cents. Now it is offering farmers 10 cents per bushel to reseal

their 1948 corn until July 31, 1949, a period of nearly two years. It pays seven cents per bushel for storing wheat.

The CCC only offers to pay storage in certain years when it considers that conditions warrant it. Perhaps the CCC will do this about half the time. This would make the cost to the CCC equivalent to five cents per year.

Large bins like those that the CCC is putting up this year cost from 17 to 29 cents per bushel erected. They should be good for 15 years, with only modest maintenance costs. Thus the annual cost of these large bins would be less than four cents per bushel. Smaller farm-sized bins would cost more, perhaps as much as six cents per bushel.

These costs would be incurred on the entire storage capacity of 1,300 million bushels, whether the bins were full or empty. If about half of the capacity were large CCC bins and the other half were small farm bins, the average annual cost would be about five cents per bushel. That would amount to 65 million dollars. On an average crop of three billion bushels, worth a little more than a dollar a bushel, that would amount to about two percent of the value of the crop.

We saw in the preceding sections that a feed grain stabilization program would increase corn producers' incomes from two to three percent, and reduce hog production costs by a less exactly determinable amount, perhaps also two or three percent. These amounts would add up to about five percent. The storage program would cost about two percent of the value of the corn crop. The total value of hog production in the United States averages about two thirds of the total value of the corn crop. Some reductions also would be made in distribution costs. Ignoring several other qualifications and complications, we can conclude that a feed grain storage program would be worth (to producers in the short run, and to consumers in the long run) several times as much as it would cost.

A Feed Grain Storage Program Could Finance Itself

In a narrow but specific financial sense, a feed grain stabilization program need not cost anything. It could finance itself.

The loan rates for large crops could be set slightly lower than the rate for small crops. This would provide something less than complete stabilization, but complete stabilization appears impractical

anyway. The rise in price from large crop years to small crop years then would cover the costs of storage.

The loan rates for large crops could be set lower than the rate for small crops by setting up, in advance, a schedule of loan rates varying inversely with corn supplies.

A total range of 20 percent—only half the range of 40 percent that is written into the Agricultural Act of 1948—would be more than ample for this purpose.

For other crops, such as cotton, where stabilization of incomes is desirable, the range of 40 percent is not great enough. For these crops, the range should be increased at least to 60 percent.

In any case, the basic loan rate (the rate for an average-weather crop) should be announced early. March would be early enough to help farmers plan the acreage they would plant. But if the rate could be announced several months earlier yet—in November, before farmers breed their sows for the spring pig crop—that would help farmers plan their hog production as well. The final rate for the current crop (as determined by the size of the current crop plus carryover) could be announced shortly before, so as to clear up the final announcement for the current crop before the basic rate for the new crop was announced.

Setting the Basic Loan Rate Each Year

The final problem then would be how to set the basic loan rate for the new crop year.

The principle involved here is clear. The basic rate should be set at the level that would move an average-weather crop on the anticipated acreage into consumption.

The problem is how to put this principle into practice. It is not easy to forecast the strength of the demand from one to two years ahead. Millions of farmers, however, now do it every year as best they can, as individuals; the U.S.D.A. ought to be able to do it better. The more difficult problem is how to resist the political pressure on the U.S.D.A. to set the loan rate high in a futile effort to raise long-time average price levels.

The existing parity formula and the recently proposed modifications of it are not suitable bases for loan rates. Parity is based on the past rather than the future, and it is designed to stabilize prices against variations in demand as well as supply. Loan rates based even on a modernized parity are likely to be too high, reducing con-

sumption and increasing production until storage stocks grow beyond the size needed for stabilization purposes.

Loan rates based on parity could be brought into line with economic realities by writing into the law the provision that whenever the corn storage stocks at the end of the crop year (that is, the carryover October 1) exceeded the quantity needed for stabilization purposes, the basic loan rate for the next crop would be reduced proportionally.⁸

Similarly, at the lower end of the range, if the carryover were less than the minimum quantity needed for stabilization purposes, the basic loan rate for the next crop would be increased proportionally.

Thus if the carryover were 1.43 billion bushels, 10 percent in excess of the 1.3 billion maximum needed for stabilization purposes, the basic loan rate for the next crop (to be harvested a year later) would automatically be reduced 10 percent. At the other extreme, if the carryover were only 70 million bushels, 10 percent (of 1.3 billion) less than the 200 million minimum needed for stabilization purposes, the basic loan rate for the next crop would automatically be increased 10 percent.

This system would be clumsy, slow, and in certain circumstances could be a bit erratic. But it would move the loan program from where it is now toward a more rational system, and do it automatically.

The Program is Basically Physical

Let us now take a little longer look at the future.

In principle, the best way to run the feed grain storage program would be to have no loan rates or loans at all.

A feed grain storage program is essentially a physical program. The purpose of the storage operations is to smooth out the variations in feed grain production, by putting the excess over average-weather production into storage in good crop years and taking it out in poor crop years.

This program need not involve loan or price problems at all. Instead of the loan rates determining how much is put in or taken out of storage, as at present, the program could be handled purely

⁸ A proportional reduction is suggested here only for simplicity and brevity. Perhaps the reduction should be only one-half as great as proportional for the first 10 percent excess of quantity, to throw the loan rate reduction process into gear less suddenly.

as a physical matter; the quantity put in or taken out of storage then would determine the price.

The simplest way to run this sort of a program would be for the U.S.D.A. to remove and later return the proper quantities of feed grains to the market by buying and selling rather than by loans. This would give the U.S.D.A. the most direct and positive control over the storage stocks.

Some practical difficulties would lie in the way of putting these principles into effect.

The first difficulty is a minor one. It is cheaper and more efficient for the U.S.D.A. to make loans on corn in the crib on the farm where it was grown than to buy it and take care of it itself. A buying and selling program would cost more, and get the U.S.D.A. more into the grain business, than the present (primarily) loan program.

The second difficulty is a major one. In the past, the feed grain storage program has been so much an integral part of the whole agricultural price support program that separating the two appeared to be a more drastic operation than the patient would accept or perhaps survive.

A fundamental change may be taking place, however, which would reduce or remove this major difficulty. Secretary Brannan's proposal to let the prices of perishable products seek their own levels and make up the difference between those prices and the "support" levels by direct payments to farmers has been rejected by Congress this year, but the idea may be accepted at some later time. It could be extended to durable products as well as perishable products. No one would worry then about the level of loan rates or open-market prices. The U.S.D.A. then could simply buy and sell feed grains on a physical basis, so as to keep market supplies stable from year to year, untrammelled by any complications about loan rates. Or, if the advantages of loans rather than purchases and sales were considerable, it could use loans as at present, unhampered by upward pressure or unsuitable formulas for loan rates. The upward pressure and the formulas would be applied instead to the "support" prices, not to the loan rates as at present, leaving the storage program free, as it should be, to deal exclusively with the problem of variable feed supplies.

DISCUSSION

ROLAND WELBORN

Swift and Company

Dr. Shepherd has a long and enviable experience in the study of corn prices and their relationship to livestock production and to the agricultural economy generally. He has for years given detailed study to the broad economics of corn storage. It would therefore be somewhat presumptuous on my part to do anything more than to raise certain questions regarding both the philosophy back of his conclusions and the basic evidence from which those conclusions are drawn.

1. So far as I can judge, Dr. Shepherd's calculation of the coefficient of variation of corn production is based on simple historical deviation of production from the long-time trend, including the variations attributable to both the extreme drought of the mid-thirties and the stimulus of two world wars, both of which he rules out as extremities which a storage program should not attempt to anticipate. I would be interested to know how much change would be involved in his concept of normal variation if he measured variation in terms of animal units fed, as he does (which is a more logical measure of availability of feed grains) allowing for trends, but *leaving out of the computations the extremes attributable to droughts and wars.*

2. I must leave to those who are more proficient statisticians than I the task of evaluating the accuracy of Dr. Shepherd's regression of supply on price. I find myself doubting greatly the significance of the calculated two to three percent variation in income from normal vs. variable crops, particularly in view of the fact that the basic data from which those estimates are derived is scarcely accurate within those limits. While such estimates are useful as a basis for price anticipations I would raise the question as to whether they are sufficiently dependable to provide a basis for investing 1.5 billion dollars in an untried economic venture.

3. Dr. Shepherd uses CCC's storage rate as the total cost involved in a corn storage program. These additional refinements may make a significant difference in his cost estimates: (a) there is an interest charge on the investment in corn of at least two or three percent per annum which should appropriately be charged against the program; (b) the same argument that is used to show reduction in the cost of producing pork is applicable in reverse to the cost of storing corn. That is to say, the cost of storage must be calculated as the cost of the facilities necessary to store the largest anticipated volume. If facilities for 1.3 billion bushels of corn storage must be constructed, the cost of those facilities becomes the perpetual cost of a storage program regardless of year to year variation in storage volume; (c) there is a relatively negligible item of administrative cost—minor in this instance, but a persistent part of a broader pattern of costs that in the aggregate has come to absorb a substantial portion of the total national income.

4. The estimated savings as a result of stabilization of pork production presupposes that grain supply stabilization would indeed stabilize pork

output. While the influence of corn supply is a major element in determining hog numbers, it is still appropriate to question how much of the variation still remains after full allowance for feed grain supply variation has been made. It is also an interesting question as to how much variation actually occurs in hog production on farms where any considerable amount of the overhead is specifically assignable to the hog enterprise.

5. I will pass over lightly the question as to whether the level of corn price is likely to be raised or lowered beyond what it would otherwise be by the existence of large stockpiles of corn. In theory, of course, the case is clear. But practice is something else again, and I am personally somewhat fearful that the existence of an average inventory in excess of needs of over 500 million bushel would result in an average corn price to farmers 15 to 20 cents per bushel lower than would otherwise prevail. That consideration is of no significance, of course, if the price is always at the loan rate, but I, for one, hope that there is something better for the future than a perpetual reliance by corn producers upon the United States Department of Agriculture price support program.

6. If Dr. Shepherd's notions of the profitability of such a program is correct, it is interesting to raise the question as to why the private economy has not undertaken it. While I have no proof to offer on the subject, I would like to suggest the following answer: excluding war periods and the mid-thirties drought, there have been only 23 years out of the 69 years since 1880 in which corn price actually increased from year to year by more than 10 percent. I submit to you that as an ordinary business proposition you wouldn't invest much money, even if you were a hog producer, in a scheme that has such a dismal profit record behind it.

All of the foregoing has been debate over quantitative judgments, a debate which can never be totally resolved, although the evidence can be clarified by a continuation of careful technical work. The major questions are those which remain, if I may paraphrase Frank Knight, after the economist has made his contribution, thereby clearing the way for a discussion of the broader issues.

The science of economics (and those who profess it) has a long tradition of argument to the effect that the material well-being of human kind is enhanced by the free play of economic competition. The only basis for the violation of these principles in the public interest is where clear evidence exists of institutional imperfections which prevent the maximization of total income through the exercise of individual initiative. Until more convincing evidence has been presented than I have thus far seen of the failure of private industry to adequately handle the distribution of corn supplies through time, and subject to a more convincing accounting of the gains to the whole economy to be made from monopolistic manipulation of corn supplies and prices, I doubt seriously that the type of institution proposed by Dr. Shepherd would make any material contribution to economic efficiency or to human welfare over the long run.

THE MISSOURI RIVER DEVELOPMENT PROGRAM

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THE purpose of this paper is to outline the major features of the Missouri River Basin development program and to estimate some of the economic magnitudes involved. Other papers to follow will appraise some of the problems.

Next to the Mississippi River drainage system, of which it is a part, the Missouri Basin is the largest basin in the United States. It includes more than a sixth of the land area, about a fourth of the farm land, and a fourth of the cropland of the country. The basin contains about 10 percent of our farm population. Half of its farm population is concentrated in the lower fourth and the remainder is sparsely populated.

The Pick-Sloan Plan

The programs for development of the Missouri Basin represent an evolution of plans by various agencies based on years of experience and investigation. For example, the Corps of Engineers formulated a basin-wide plan in 1943 which expanded the previous flood-control and navigation plans to include additional multiple-purpose reservoirs on the main stem and tributaries of the Missouri River, and flood protection works for municipalities and agricultural lands. In the following year, the Bureau of Reclamation recommended a plan for basin-wide development for irrigation, power and other purposes. These reports were integrated by the two agencies and presented to Congress. In the Flood Control Act of December 22, 1944, Congress approved the coordinated plan, commonly known as the Pick-Sloan plan. Since that time additional proposals have been made. Present plans include about 150 reservoirs with a storage capacity of about 100 million acre feet; levees for protection of two million acres of agricultural lands in the Missouri Valley and major tributaries below Sioux City, Iowa; levees for municipal areas; systems for distribution of irrigation water for new lands totaling five million acres, and supplemental water for another two million acres; hydroelectric plants having an eventual installed capacity of 1,600,000 kilowatts of power and an annual output estimated at 10 billion kilowatt hours of electrical energy;

and improvement of the channel and provisions for navigation from Sioux City to the mouth of the river.¹ Congress has authorized a total amount of \$350,000,000 to be expended by the Corps of Engineers and \$350,000,000 to be expended by the Bureau of Reclamation for partial accomplishment of the program.²

According to the Pick-Sloan plan, the multiple-purpose reservoir projects on the Missouri River will provide for the maximum practicable storage of water on the main stem. The water to be impounded in these, as well as in the other multiple-purpose reservoirs on tributaries, will be utilized for irrigation, navigation, power and other multiple purposes. Sufficient storage will be reserved in each reservoir to provide for flood control needs. To protect towns or municipalities and agricultural areas that are subject to flooding from run-off originating in storms over areas not controlled by the reservoir projects, the plan provides for a system of levees on both banks of the Missouri River from Sioux City, Iowa, to the mouth and the required flood-control works on tributaries. Water will be available for domestic and industrial water supply and pollution abatement, and it is proposed to develop the recreational uses of reservoir areas.³

Shortly after approval of the Pick-Sloan plan for the Missouri River Basin by the Congress, the Missouri Basin Inter-Agency Committee was established to provide a means for the participating federal agencies to coordinate their activities among themselves and with those of the Missouri Basin states. On this committee are five Governors of the Missouri Basin states who were selected by the Governors of the 10 states in the Basin to represent state interest in the Program. On the committee, federal interest is represented by one member each from the Corps of Engineers, War Department, the Federal Power Commission, the Department of Interior, the Department of Agriculture, and the Department of Commerce.

¹ *The Development and Control of the Missouri River*. Department of the Army, Corps of Engineers, Missouri River Division, Omaha, Nebraska, December, 1947. See also Senate Document 191, 78th Congress, 2nd Session, *Missouri River Basin* (Report by Secretary of the Interior, Harold L. Ickes, on Bureau of Reclamation's Plan for Basin Development), April, 1944. House Document 475, 78th Congress, 2nd Session, *Missouri River Basin*, March, 1944. Senate Document 247, 78th Congress, 2nd Session, *Missouri River Basin*, (Supplemental to Senate Document 191 and House Document No. 475, 78th Congress), November, 1944.

² Flood Control Acts of December 22, 1944 and July 24, 1946.

³ Message by the President to the Congress of the United States on the *Comprehensive Plan for the Development of the Mississippi River Drainage System*, July 16, 1947. Appendix 1: Comprehensive Plan for the Missouri River Basin.

The Agricultural Program

Many of the people connected with the Inter-Agency Committee and interested in development of the Missouri River have recognized that the Pick-Sloan program does not provide a complete authorization for resource development because it provides for control and use of water in the main stream channels only. They have urged that an agricultural program be developed to deal with watershed, conservation, and other land-management problems of the basin. At first it was thought that this need could be met under existing national programs. However, it was soon discovered that the agricultural phases of the development were lagging and that it was very difficult to integrate national agricultural programs with other phases of the development which were on a project basis.⁴ In July, 1948, after three years of participation in the Missouri Basin Inter-Agency Committee, the Secretary of Agriculture ordered an agricultural plan to be prepared which would integrate the activities of the Department relating to the development, utilization, and conservation of natural resources into a unified basin-wide program.⁵ The program would be designed to: "Conserve and improve the lands of the basin; build up and protect the forest resource; protect and develop the water resource; enlarge and improve the farm plant by irrigation and drainage; reduce flood and sediment damages, enhance recreation and wildlife; and otherwise support, complement and balance the programs of other agencies—particularly the engineering activities being carried out under the Pick-Sloan plan."

The agricultural program was prepared by a field committee made up of representatives of various bureaus. This group had the active cooperation of representatives of the Land-Grant Colleges and several other state and federal agencies. An inventory of land and water conservation and development needs in the basin was prepared based on past experience and investigation.⁶

The program that has been developed to meet these needs offers no startling innovation in land use or in its approach to the con-

⁴ Opinion in the Department of Agriculture has been divided. One group has favored preparing special basin programs. Another group has felt that such a move would jeopardize existing national programs.

⁵ Secretary of Agriculture Memorandum, No. 1220, July 9, 1948, *Preparation of an Agricultural Plan for the Missouri Basin*.

⁶ *Missouri River Basin Agricultural Program*. U. S. Department of Agriculture, April 1948.

servation problem. The body of the program represents functions and activities which already are under way in some measure in the basin. The unique qualities of the program are: (1) a procedure by which all phases of a complete program of land-management and upstream engineering can be applied to problem areas for conservation and flood control; (2) a procedure for integrating the work of the Department of Agriculture with that of other federal agencies on irrigation, drainage, and other land- and water-development projects, and (3) the recommendation of a greatly accelerated program for the basin which would keep pace with the engineering phases of the Pick-Sloan plan.

The agricultural program has five major operating phases.

1. A program of conservation and improvement measures on grassland and cropland is designed to reach all of the 582,000 farmers and ranchers in the basin. The goal is the application of good land-management and conservation practices to the farm and ranch lands of the basin. This would involve adoption of improved management and land use practices on the 113 million acres of cropland in the basin and the seeding of 20 million acres to grass and legumes for rotation hay and pasture. Needed also would be measures such as 1,900,000 miles of terraces, grassed waterways and others to retain or dispose of water. The privately owned grassland also needs improved management. This includes reseeding of 17,500,000 acres of depleted range, development of water supplies, fire guards, and fences.
2. A program for forest and forest range would cover an estimated 45 million acres, of which 22 million is in public ownership. The forests are a resource with many uses—timber, grazing, recreation and wildlife, and the protection of water supplies. This latter function is of particular importance in federal forests which are the source of a substantial share of the water available for irrigation. The program is designed to improve forests and ranges by applying better management, fire protection, plantings, and many other improvements. On privately owned land the program would be carried out by furnishing technical assistance and financial aid to private owners.
3. A program of stabilizing measures for small watercourses has been proposed to assure safe disposal of water in small watersheds and the lesser tributary streams. This will reinforce land conservation measures, contribute to flood control and to the protection of lands being destroyed by major gullies, bank-cutting, and sedimentation. The program contemplates the construction of measures which generally affect more than one farm. These would include gully-control structures, floodways, bank-protection works, small retarding basins and others.
4. The program for irrigation involves (a) educational, technical, credit, and financial assistance to rehabilitate and improve the use of land

and water on existing irrigation projects, (b) factual data and technical advice in areas for which new irrigation is planned, and (c) assistance and services to farmers in developing land improvements and systems of farming under new irrigation.

5. The drainage program for the Missouri Basin is planned for an estimated 5,800,000 acres now in drainage districts or needing additional drainage. It is estimated that half of this acreage needs some degree of improvement or rehabilitation. The Department will assist farmers in rehabilitating drainage systems and in constructing new systems. It will also help individual farmers with their drainage problems.

These operating phases of the agricultural program are supported by research and investigations, soil surveys and land classification, education and credit.

1. A much accelerated program of soil surveys and land classification is needed to guide the land and water program. The soils of the basin show enormous diversity. Seven types of surveys are recommended to meet the requirements of various parts of the basin. These range from intensive surveys for proposed irrigation projects to extensive surveys in forest and grazing areas.
2. Research and investigations needed to support the recommended programs of land and water development have been designed through the combined efforts of the Department of Agriculture and the Land-Grant Colleges of the Missouri Basin. Accelerated research is recommended to precede and guide the greatly expanded programs of irrigation, drainage, land treatment, and watershed management in prospect.
3. Agricultural extension activities would be intensified to assist rural people to make maximum use of land newly developed for irrigation and protected from floods by levees and drains; to make the best use of electric power; to apply accelerated land conservation and flood-reduction measures and to adjust farming to new crops, new markets, and new methods.
4. Special credit facilities are recommended to supplement private credit agencies in view of the expectation that farmers, ranchers, and landowners will invest three to four dollars for every dollar of Federal funds expended for conservation. Application of conservation measures, and development and improvement of irrigation and drainage systems often require a type of developmental credit that is unavailable from private lenders.
5. Special studies are recommended to assure that the rural electrification systems for the basin will be completed and integrated with the power features of the Pick-Sloan plan. Continuation of present authorizations will provide ample loan funds to complete electrification of the area.

The agricultural program was submitted to the Missouri Basin

Inter-Agency Committee at Rapid City, South Dakota. The Committee meeting at Helena, Montana, July 21, 1949, passed a motion that the "Inter-Agency Committee thank the Department of Agriculture for preparing the report, endorse the general objectives and recommend that Congress take the necessary steps to put the program into effect."⁷ As soon as review by other federal agencies has been completed, the report will go to Congress.

Cost of Missouri Basin Development

The cost to the Federal and State Governments of the Missouri Basin Development has been currently estimated as follows:

Corps of Engineers ⁸	\$2,019,000,000
Department of Interior ⁹	3,024,000,000
Department of Agriculture ⁹	3,092,000,000
Other Federal (6 years) ⁹	20,000,000
State Government (6 years) ⁹	100,000,000
	<hr/>
	\$8,255,000,000

The development period is usually thought of as extending over a long period of years. If 30 years is used as in the agricultural program, the annual rate of expenditures would be about \$275,000,000 for federal funds. In the fiscal year 1949 the Corps of Engineers received \$92 million for the basin, and the Department of the Interior, \$87 million, or a total of \$179 million. The Department of Agriculture made expenditures for the type of work covered in its program from its regular or national funds of about \$24 million in the Missouri Basin, but received no special appropriation in 1949 for this area. From these rough calculations it can be seen that a considerable acceleration of the agricultural program is needed to put it on a schedule that will be comparable to the other phases.

Land Use Changes

It is not the purpose here to attempt a benefit-cost analysis. However, part of my assignment was to estimate the agricultural changes from the Basin development. These might be summarized as follows:

⁷ Minutes of the Thirty-Second Meeting of the Missouri Basin Inter-Agency Committee, July 21, 1949.

⁸ Missouri Basin Inter-Agency Committee, *6-Year Program for Missouri River Basin*, July 29, 1948.

⁹ U. S. Department of Agriculture, *Missouri River Basin Agricultural Program*, April, 1949.

Two million acres would be given protection from floods.

Five million acres now dry-farmed would be brought under irrigation.

Two million acres now irrigated would be furnished supplemental water.

One million acres of small irrigation would be developed.

Three million acres would be benefited by new or improved drainage facilities.

Ten million acres of cropland would be returned to grass.

Another ten million acres would be shifted from soil-depleting crops to rotation hay and pasture.

A land management and conservation program would be applied to all lands.

Two and one-half million acres are included in reservoir sites.

Of this, one million would be flooded only occasionally and could be continued in agricultural use.

Data on expected production changes are rather meager. Such estimates as are available indicate, for example, about a 10-percent increase in value of crop production from irrigation in the Missouri Basin and about a 19-percent increase in crop production from the conservation program. A small loss from reservoirs would amount to less than one percent.¹⁰ The net increase in production from these sources would be about 28 percent when compared to crop production in the basin and four percent when compared to national production. Other changes in production would occur because of flood protection and drainage, range management, timber production, etc. These changes would take place gradually over a long period of years.

¹⁰ Bureau of Agricultural Economics unpublished estimates based on data from the Bureau of Reclamation, Corps of Engineers, and the Soil Conservation Service. Comparisons are based on 1939-44 prices.

AN ECONOMIST'S APPRAISAL OF THE MISSOURI RIVER DEVELOPMENT PROGRAM

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THE magnitude of the Missouri River Valley in physical area and the variety and complexity of its resource use problems are such as to cause proposed resource development programs for the area to have general appeal and interest throughout the nation. In appraising the proposed developments which have been presented in the preceding paper it would be wise for us to keep two things in mind: (1) the great importance of agriculture in the Basin; (2) the strategic role of water.

The Missouri River Basin is primarily agricultural and promises to remain so for a great many years. Therefore, any sound or complete development program must, of necessity, include a sound agricultural development program including land management and soil conservation, and give primary emphasis to all aspects of the overall program which will improve and help stabilize the farm and ranch operations of the Basin.

In the upper Missouri Basin states, normal rainfall is relatively low and extremely variable with recurring droughts. In this semi-arid part of the Basin, the conservation of water through sound watershed management, storage and wise use, is of primary importance; while in the lower part of the Basin a humid climate exists and flood damage is considerable. Because of these conditions maximum economic development and use of water in the Basin is a key to maximum human welfare in the area. Control and use of water in the main stream channels through big construction projects is only a part of an adequate water use program. Sound land management and cropping practices to control run-off, sound forest and range management practices to achieve maximum water-holding capacities, and stabilization of water courses to reinforce land use practices in order to hold water on the land and ease it to the main stream channels without flood or overflow damage, are all highly significant parts of a complete water use program along with large dams or construction projects.

Agricultural Development Program

Unwise management of land and poor land and cropping prac-

tices are common throughout the Missouri Basin. This in itself does not justify an extensive agricultural program of the nature proposed, however, because similar conditions exist in other river basins of the country. What justification is there for a special agricultural development program for the Missouri Basin? Is this a mere starting point for similar programs to be proposed and urged for other river basins in the nation? Or is the need in the Missouri Basin for such a program particularly acute and timely?

The Flood Control Act of 1944 places irrigation in the front rank of priority uses of water in the West. The Pick-Sloan Plan, developed by the Corps of Engineers and the U. S. Bureau of Reclamation, proposing construction of some 150 large reservoirs and for which Congress has already authorized a total of 700 million dollars, makes a complete agricultural program essential. The scope of the Pick-Sloan Plan is such that unless other programs are designed and carried out for the area which will make available the information necessary for sound overall development, a great waste of public funds as well as incomplete and unsound development may result. Moreover, the uncertain growing conditions in the upper Missouri states because of the semi-arid climate make it imperative that this large agricultural area of the nation be developed in such a way as to stabilize its production and contributions to the national welfare as quickly and as completely as possible. Large public expenditures for relief and feed and seed loans in the Upper Basin states were necessary in past years when adverse weather and business conditions and severe insect pest ravages occurred. Development programs that will help stabilize farming and ranching operations in these states will relieve the government of future relief and emergency expenditures. More important, sound agricultural development programs will permit the Missouri Valley with its great grain and meat production capacities to make its maximum contribution to the national welfare. We should not forget that one-fourth of the nation's farmland lies in the Missouri Basin. Farm output in the Basin during the past decade under favorable weather conditions has been a very significant factor in making it possible for us to improve our level of living at home at the same time that we carried out a major war and its attendant post-war reconstruction and rehabilitation programs.

The question immediately arises as to whether an agricultural

development program such as that which has been explained in the preceding paper should precede a major engineering or construction program such as the Pick-Sloan Plan, or whether it should be carried out concurrently with such a program, or whether it should follow the construction program. The facts are, of course, that the large engineering and dam construction program is already under way while the detailed agricultural development program is merely in the proposal stage. Some contend that construction planned in the Pick-Sloan program will not only needlessly flood hundreds of thousands of acres of land but will create huge silt traps, without at the same time checking serious flood water damage in the small water courses and farming areas generally. To carry out the agricultural program concurrently with the dam construction program may result in our discovering that the basically sound agricultural program will leave us with many large reservoirs which will never operate as now planned. Hence some suggest that the research and educational phases of the agricultural development program together with the land management phases should be pushed rapidly now, before any further work is done in the construction of large dams as contemplated by the Pick-Sloan Plan. The Department's agricultural program as presented indicates that what might normally be undertaken over a one hundred-year period has been telescoped into a thirty-year project proposal, but perhaps it should be telescoped still further into a fifteen- or twenty-year proposition, particularly since much of the information and resulting developments are essential for a future sound system of major dams in the Valley.

This should not be interpreted to mean that agricultural development as proposed in the five-point program should be complete in 15 to 20 years. As a matter of fact, full agricultural development will probably never be complete. The educational and research phases of the program, however, need to be greatly speeded up. The next five to 10 years should reflect tremendous expansion along these lines.

Is the Missouri Development Program Needed?

Currently we are faced with the threat of great surpluses in several farm products including wheat, one of the major products of the Missouri Basin. Acreage limitations are being worked out to reduce wheat acreage. Under these conditions, what economic

justification is there for undertaking the five-point agricultural development program proposed? It is said that the development program will ultimately result in increasing the irrigated farm land of the Basin two and a half times from the present five million acres to some 12,500,000 acres. This more than doubling of present irrigated acreage would mean a great increase in the agricultural production of the Missouri Basin, but it is estimated it would increase the total farm production of the United States by only a small amount. For example, the increased irrigated acreage contemplated under the Pick-Sloan Plan would result in a 70 percent increase in the crop output in the Upper Missouri Basin states, and a 40 percent increase in crop output for the entire Basin, but would result in an increase of only about five percent in the total United States crop output.

Part one of the five-point agricultural development program, "Conservation and Improvement Measures on Grasslands and Croplands," is designed to achieve good land management and conservation practices on all the 582,000 farms and ranches of the Basin. More than a third of the approximate three billion dollars proposed for the agricultural development program (\$1,189,630,000) is proposed to be spent on Part One. Certainly this part of the program should result in increasing the farm output of the Basin as well as to make the output more certain, consistent or stable year in and year out. The prospective increase in the country's population for the next thirty years does not seem sufficient in and of itself to warrant any large increase in farm production. Present prospects for large exports of farm products at profitable prices also do not appear bright. But, if the management and conservation practices result in increased livestock and meat production through better forage, hay and feed production, rather than increased cash grain farming, the Basin agricultural development program should fit in well with national needs for the next few decades.

The major objective of increased irrigated acreage in the Missouri Basin through large dam construction should be the stabilization of existing agricultural operations, primarily the range livestock industry through the production of more hay and feed supplies. It is generally agreed that increased numbers of livestock will be needed in the United States to maintain a satisfactory standard of living, particularly in view of prospective population increase during the next thirty years. The stabilization of the

livestock industry in the Missouri Basin can best be brought about by integration of irrigated lands with the surrounding dry bench lands and grazing areas. Development of additional irrigated farms for the production of cash crops will not contribute to the welfare of the Basin population or to the national welfare as much as will a program in which the newly irrigated lands are primarily used to stabilize operation of existing dry farm and ranch units. If ways can be worked out whereby the new irrigated acreages can be made a part of existing units and used primarily for the production of hay and feed supplies, maximum beneficial production and the most satisfactory and stabilized agriculture for the Basin can be achieved. For example, if a limited acreage, say 40 or 80 acres, of irrigated land could be made available for the individual operator where he could have his home and his operating headquarters, he could, in addition to having a satisfactory garden, produce adequate hay and feed supplies for his livestock. He might also have allotments in grazing districts for summer range of his beef cattle and produce grain on near by benchlands. If, on the other hand, newly developed irrigated areas are developed to be complete operating units alone, and are used primarily for the production of cash crops, such as wheat, beans, etc., the lands will not contribute to the further stabilization of output of existing farm and ranch units. There is no assurance in programs already under way or being proposed that such integrated use of irrigated lands will be achieved. Much good thinking and administrative action is needed along these lines now.

When one ponders the scope of some of the proposed developments, he is likely to conclude that it is some bureaucrat's idle day-dreaming. For instance, 500,000 new ponds seems like an excessive number, but the Missouri Basin covers a large area and anyone who has traversed the Plains knows it is "big" in every sense of the word. The proposed 14,000 to 16,000 small upstream dams and 400 to 600 desilting and debris basins may sound excessive, but careful study of the many small streams and water courses of the Basin will show that the number may be an underestimate, rather than the reverse. The one billion dollars proposed for this phase of development is absolutely essential if we are to get value received from the five billion dollars proposed to be spent by the Corps of Engineers and the Bureau of Reclamation in constructing 150 large dams or reservoirs.

Experience with heavy silting of large reservoirs already con-

structed in the West should emphasize that Point 3 of the five-point agricultural development program, "Stabilization of Small Watercourses," is not competitive with the Pick-Sloan large reservoir construction program, but complementary and absolutely essential for its successful operation. Point 1, "Conservation and Improvement Measures on Grasslands and Croplands," including terracing, grassing of waterways, reseeding depleted ranges, strip cropping, and contour farming is likewise basic and complementary. It would appear that the tentative allocation of two-thirds of the total of three billion dollars proposed to be spent on the agricultural development program for these two phases is justified.

Conclusions

Although the agricultural development phase of the Missouri Development Program does not have the dramatic or glamour appeal to the public imagination of the big reservoir construction phase, it nevertheless, over the long pull, promises equal if not greater advantages to the Basin and to the Nation. The estimated total cost of somewhat over eight billion dollars for the entire program is a large sum, but in terms of modern federal fiscal accounts does not loom as excessive. Before we can be certain that this eight billion dollars will be a good investment much sound thinking must be done on other phases of overall development in the Basin comparable with that which has been done by the Department of Agriculture staff members, in developing the proposed Missouri River Basin agricultural program. Reference is made to power development and utilization, including rural electrification and industrialization, and to navigation. These two enterprises are emphasized in the large dams construction phase of Missouri Basin development along with irrigation and flood control, but much heat and little light has resulted from the discussions of these two enterprises to date. There are many phases of public power development which need to be studied and an adequate program mapped out, but the navigation aspects particularly should be subject to very careful scrutiny from the standpoint of possible economic benefits before any further steps are taken to allocate water for this use in achieving a "9-foot channel," etc. Water is a very precious thing in the Upper Missouri Basin, and while the agricultural development program, if adequately carried out, would go a long way to conserve and make possible maximum avail-

ability of water in the Upper Basin, it will be of little local or national avail if the resulting water is not put to its most important and best uses. Whether navigation can qualify as a claimant in this category has certainly not been established on any sound basis. It would seem that in the long run, Basin, national and world interests would dictate that wise conservation and utilization of water for stable and maximum production of food and fiber would be a "better" use of such waters, if not the "best."

This writer concludes that the proposed eight-billion-dollar expenditure in the Missouri Basin can be a very good investment for the nation in the years ahead. Because they lack the glamour and appeal to the public imagination which some other phases of the program possess, there is grave danger that the agricultural phase and similar detailed information and proposals needed on other phases of the overall program will be sidetracked or carried out inadequately. They are basic, however, to a sound over-all development program and should take a position of priority rather than a second- or third-rank position.

For the next few years it would seem highly desirable to emphasize the five-point agricultural program and to speed up work particularly on the educational and research aspects, especially soil surveys and land management, before we proceed too far with construction of large dams and reservoirs. The agricultural development program is essentially a grassroots program. To be fully effective it will require adequate support for its educational and research phases. If such support is forthcoming and the Land-Grant Colleges and Universities' staffs are equal to the challenge, a long step will have been taken toward assurance of sound overall development of the Missouri Basin for the years to come. Complete development will take many, many years, but it's high time that we put first things first in the Missouri Basin. The proposed agricultural development program presents an important challenge to Land-Grant institutions, particularly to agricultural departments, and more especially to departments of agricultural economics and rural sociology.

A CONSERVATIONIST'S APPRAISAL OF THE MISSOURI DEVELOPMENT PROGRAM

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THE Missouri Basin includes about one-sixth of the land area, one-fourth the farm land and one-fourth the cropland of our United States. The Basin is, of course, paramount to the people who inhabit it and the agricultural significance, together with the industrial and other parts of our economy within its boundaries, makes the Basin of no little importance to the nation.

During the last three or four decades we have stepped up the development tempo within the Basin—at least the part involving direct exertion of the public's efforts. A number of lines of public endeavors were initiated during the 'teens and 'twenties. Some of these were federal activities involving application of a nation-wide program either throughout or within a specific portion of the Basin. Some were endeavors by states or through local government—as counties, municipalities, irrigation districts, drainage districts and the like. In the thirties, partly because of the depression and the drought—which was particularly severe in a large portion of the Basin—certain going public activities were re-emphasized and additional ones were initiated. Several of these stressed either new or increased emphasis upon conservation, use and development of agricultural land and water resources.

From the conservation viewpoint among the most significant of these new endeavors and results perhaps were:

1. Programs for the public providing technical services and grants of direct aid for conservation purposes;
2. Beginning of soil conservation districts as local governmental subdivisions through which landowners and operators, when they so choose, can cooperatively exercise their own initiative and responsibility for soil and water conservation purposes and obtain help from all public and private sources in so doing;
3. Increased attention to irrigation in parts of the Basin and to proper drainage in others;
4. The growing knowledge on the part of landowners and operators and the public generally that the nation's land and water resources are not limitless but that these resources could be

used to maximize productive capacity on both a current and a sustained basis and, if need be, on a reserve basis.

In 1944, we added the Pick-Sloan Plan for the Basin. This plan deals primarily with major structures along the mainstem and the large tributaries, such as large dams storing water for power production, for irrigation, and for flood control and navigation; levees and revetments for flood control; and major canals and ditches for distributing irrigation water or for draining off excess water. This plan¹ apparently serves the same general functional purposes as the declaration of policy in the most frequent type of legislative authorizing act.

And in 1949, we have the Missouri River Agricultural Program.² Since Congress has taken no action, it is still in the embryonic stage insofar as legislative action is concerned. This plan deals with two categories of activities: first the practices, measures and land uses which when adopted on the land and small tributaries conserve the land and water, and retard and reduce runoff thereby reducing floodwater and sediment damages; and secondly, activities that facilitate programs leading towards adoption of such practices, measures and land uses. The "on-site" and "off-site" effects of such of these practices, measures and land uses, as are soundly applied in the locations where they are adapted, bear both directly and indirectly on the works described in the Pick-Sloan Plan. Thus, the work described in each of the two plans is intended to be supplementary and complementary to the work described in the other. When once the work gets into gear there would be no twilight zone between the necessary large engineering works along the mainstems and the necessary work on the watershed lands and small tributaries.

In view of the setting, a conservationist's appraisal of the Missouri River Development program probably should include considerations of the need and major approaches and problems.

Cursory examination by the close observer points quickly to the need for further conservation in the Missouri Basin. Examination of available research results and survey reports shows even more vividly the necessity for this work. There can be little question but

¹ Public Law 534—78th Congress.

² The Missouri River Basin Agricultural Program, a program recommended by the Secretary of Agriculture Charles F. Brannan for the development and conservation of land, water, and forest resources, and for flood control in the Missouri River Basin, USDA, April, 1949.

that further conservation and development will be accomplished within the Basin. Also, there can be little doubt but that further conservation and development is practicable from the separate or combined viewpoint of individuals, local governmental subdivisions, the states, and the nation. The many questions as to what, how, and when will only be answered month by month, year by year, and decade by decade as progress is made—but then not to the satisfaction of all. The estimates on quantity of work needed as shown in either the Pick-Sloan or in the Agricultural Plan developed by the Department of Agriculture will undoubtedly be subsequently proven less than completely correct. But the main consideration is that the types of work described need to be done. Surely methods and approaches will be improved from job to job as the work progresses, experience is gained and additional research conclusions become available.

Each type of work described in the five operational programs and in the five facilitating programs of the agricultural plan are now being carried on—to varying degrees—under one or more legislative authorities. If the objectives are to be attained in the time estimated—30 years—the problem becomes one of accelerating the various types of work in proper timing and sequence. To do this will require both careful timing in the availability of the required public funds and adeptness in using those that become available.

Too, it seems likely that in the computations back of the various estimates, the proportion of the total cost the public should bear has been overemphasized. Broadly speaking, for the work that really needs to be done, surely the public should bear the proportion of the cost inputs that represent “off-site” benefits. And landowners and operators should bear the costs for “on-site” benefits. There are numerous indications that the “on-site” benefits are greater than are generally recognized. If approached with reason and practical recommendations, the landowners and operators will apply and maintain a larger proportion of the needed work than if they are otherwise approached. The proportion of costs currently estimated as the public’s share can probably be lessened as the measures and practices are applied.

The public is composed of *all* individuals and interests. It carries on its endeavors through units of government. The people, through their state, county, municipal and other local governments, stand to benefit from the proposed work being performed. Units of

government other than the federal should, therefore, proportionately share in the work that is done. It is entirely probable that current estimates have under-emphasized what should rightfully be done by the members of the partnership represented by units of government other than federal.

The old axiom relating to the whole and its parts is equally applicable to the Basin. Sound conservation analysis and action for a region of this size and complexity must encompass several physical areas of progressive inter-dependencies.

1. The watershed.
2. A sub-watershed (or major tributary).
3. A minor watershed (or minor tributary).
4. The very small watershed including a few such tracts.
5. The individual tract of land—farm, ranch, road right-of-way, etc.

The predictable effect of some measures may be nearly all "on-site," the effect of others may be partly "on-site" and partly "off-site." And still others may be entirely "off-site" or downstream from their location. While the agricultural plan, of course, failed to describe all the problems and solutions in realistically clear perspective, there is a tone of interdependence between the work and activities recommended that is somewhat uncommon. Hence, to the degree that the plan is carried out, it will be useful as a guide to facilitate integration of the various activities and types of work.

Considerable progress has been already made in getting conservation on the land. Close to 400 soil conservation districts have been organized covering about two-thirds of the Basin. Thus far, these districts have helped farmers and ranchers bring under conservation management around 40 million acres. Of these, about 25 million acres have been completely treated with a good conservation program safeguarding the productive capacity of the land and increasing the efficiency of farm and ranch production. And, about 600 thousand of these acres represent intensive irrigation and drainage practices. The remainder involves practices and measures for conservation of soil and water, proper management of soil, crops, range, woodlands and includes also the conversion of approximately $1\frac{1}{2}$ million acres from crops to grass or other permanent cover.

The formation of these districts has taken place during the last twelve years. Their accomplishments in large part have occurred

during the last five years, and progress of the movement can be said to be most encouraging.

While the type of work just mentioned has considerable "off-site" benefit its primary effectiveness is on the land where it is done. The other phase of upstream conservation—with the objective of retarding runoff, of increasing infiltration, of stabilizing small water courses, and reducing sediment damage on land and in reservoirs, and of other downstream values—has just begun. Historians are likely to say that the '30's and '40's were a period during which we went through the mental throes of understanding this concept and developing ways and means for doing something about it. (By way of parenthesis I add, many of you will recall that only about two decades ago did we begin to really try to do something about the conservation of the nation's land—especially the privately held farm and ranch land. Now, conservation is generally accepted and the common statement is that accomplishments need to be speeded up.)

At present, this second phase of conservation work is being carried on in the Basin with particular emphasis only on the Little Sioux Watershed consisting of some 4000 square miles in Iowa and Minnesota. Work is underway in 17 of its sub-watersheds. Both phases of conservation work are being done as an integrated job. Conservation treatment and use of the land, and small flood-water retarding structures, measures for the control of headcutting gullies, and other measures for stabilizing small watercourses all become integral parts of a single job. Twelve soil conservation districts are taking part in this undertaking. The district commissioners—as district governing body members are designated in Iowa—have organized themselves into a watershed working committee to determine priority of sub-watersheds and to properly relate the work in each sub-watershed to the work in the others.

It takes time for farmers and ranchers to understand their land and water problems, to organize themselves, and to make the decisions they need to make in order to move the work along in an orderly fashion. In developing approaches for attaining conservation and development objectives in the Basin we must not overlook our cherished system of private land titles under which is held, in fee simple titles, a large proportion of the agricultural land, including range and woodland. Those holding title may be intensely interested, or have no interest in the success of their tract. They

may live on the farm, or in a nearby town, or thousands of miles away. Soil, slope, topography and climate vary from one section of the Basin to another and from farm to farm or ranch to ranch. The desires, aptitudes, likes and dislikes of individual farmers and ranchers also vary from unit to unit. And so it is that the conservation and land use practices applicable on one farm in the upper part of the Basin are not likely to be either practical or effective in the lower part—or perhaps even on an adjoining tract. The conservation practices and land uses must fit the land and at the same time suit its owners and operators.

The meanings symbolized by the first three words of the Constitution of our Nation, "We the people . . ." are at work and are bringing about the conservation and development of the Basin. The problems confronted are many and complex. Progress is rapid but the job is big. Attainment of objectives will require many years.

AN ENGINEER'S APPRAISAL OF THE MISSOURI BASIN DEVELOPMENT PROGRAM

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IN CONSIDERING the Missouri Basin Development Program from an engineering aspect, it seems almost impossible not to touch upon certain other aspects such as economic, political, and social considerations. Engineering considerations must always take into account various other influences. Any good engineer will recognize these influences and temper his engineering decisions to some degree in accordance with those outside influences. However, these outside influences should never be allowed to predominate to the point where good engineering becomes secondary.

The Missouri Basin Program is certainly of national importance in many ways. The economy of the area will always be a vital factor in the economy of the nation. The bulk of the expenditures being made for development come from the federal government, yet has any economic analysis of the program, from a national point of view, ever been made? Is it desirable to carry on the program at such an accelerated pace during this particular national economic level? Do we need increased production, in some cases costing hundreds of dollars per acre, at this particular time when we find it necessary to have price supports on farm products at a high level?

Soil erosion is depleting the productive capacity of the Basin at a rather alarming rate. In order to maintain and increase the productive capacity, it seems logical that soil conservation measures should occupy a high priority in any development program for the Basin. Strange to say, this matter has received serious consideration only in recent months and very little work has been done to accelerate the program of soil conservation. On the other hand, irrigable land represents a potential productive capacity that does not deteriorate when not in use and can be brought into use at the proper time to bolster national production when it is most needed.

It seems that the first requirement for the Missouri River Basin is to enhance the economy of the region to the point where it becomes a national asset rather than a national liability. I seriously question whether the development program, as it is now being carried out, will of itself accomplish this. I see very little attention being given to industrial development. Industry is certainly one

important factor in developing the potential economy of the Basin. Power produced from the development program may constitute some inducement to industry but of far greater importance are transportation costs, markets, capital, labor, and industrial know-how. I see nothing in the present program that gives serious consideration to any of these factors. There are many other resources such as minerals and forests which are not receiving the attention they should in the program.

One must conclude that, from an engineering standpoint, the planning and execution of the Missouri Basin Program is almost entirely backward. The reasons for this are many in number and varied in character. In the first place, this nation continues to grope blindly for want of a suitable comprehensive national policy with respect to resources development. Hence, as a nation, we are totally unprepared to squarely face a problem of the magnitude of the Missouri Basin Program. The engineering features contained in the Program were planned by various agencies which by law are restricted to narrow objectives. The Program was authorized by Congress hastily as the result of a wave of hysteria resulting from the floods of 1943 and 1944 and of the rising tide of sentiment for a Missouri Valley authority. It is true that the projects authorized had been under consideration and analysis for a number of years, but always with limited objectives in mind.

The first logical step in planning a River Basin Development Program is to take an inventory of the resources and problems and then list them in the order of their relative importance. Planning should then proceed as nearly in accordance with this listing as practicable. This has not been done to date in the Missouri River Basin.

Engineering for the Missouri River Basin Development may be divided into four phases. The first phase is the engineering planning. The second phase is the design of engineering structures. The third phase is the construction and the fourth and last phase is the operation of the completed structures. A large part of the planning has been done although I expect some of it may have to be redone. Considerable design of specific structures has been accomplished and we are in the process of carrying on the construction at a rather high rate. Operational problems to date have not been encountered in major proportions, but they will surely come. In my opinion, the planning phase is the most important of all the engineering

tasks presented. I think, perhaps, this has been the weakest of all the engineering work.

Engineering design has become a rather set mathematical science. Construction under American engineering direction is something that the whole nation can well be proud of. Operation becomes a matter of making the most of the physical conditions at hand. Operations problems can become extremely difficult if the planning and designing phases have not been properly carried out. For instance, if a flood control reservoir has not been properly planned for use with other reservoirs in a system or if the design capacity is insufficient, certainly operation of that reservoir becomes an extremely difficult matter. If irrigation storage is not properly placed, or is inadequate because of insufficient data on available water, the operating engineer again takes a beating. Certainly, if irrigation storage is constructed without a thorough knowledge of the soil to be irrigated, considerable difficulty may be encountered. Likewise, if drainage problems are ignored on land to be protected by flood control reservoirs, or a system of reservoirs, release from the reservoir may well cause trouble. If a stream flows from three-fourths to bank full for a long period of time as a result of release from a flood control reservoir, or a system of reservoirs, the land adjacent to the stream cannot be properly drained and crops will die just as surely as if they had been covered for a lesser period of time by flood water. I am firmly convinced that some of the land which is now considered to be irrigable and on the basis of which irrigation storage is being considered, may later prove to be unsuitable for irrigation. I am also convinced that insufficient attention has been given to land drainage in general and especially on land below flood control reservoirs.

Some \$350,000,000 has been spent on the Missouri River under the name of river navigation. Yet, to date, there is no appreciable navigation on the river—certainly no amount commensurate with the expenditure of funds that have been made during the last twenty years. I am "from Missouri" on the question of navigation on the Missouri River. I think it would be a fine thing if it would develop to the point where it would completely pay its way. I question whether this point will be reached and I question the engineering feasibility of producing a navigable channel that will encourage the use necessary to offset the cost. I especially question the open-channel methods now in use.

From strictly an engineering point of view, the present laws pertaining to power distribution are not satisfactory. The shortest possible transmission distance from the point of power production to the point of consumption is the situation which the engineer likes to see. Distribution losses can thereby be kept to a minimum and the maximum amount of power reaches the consumer. Under existing law, public bodies such as municipal distributing bodies and power cooperatives receive first priority in the purchase of federally produced power. Hence, in order to reach these public bodies, longer transmission distances than would otherwise be necessary will frequently be encountered. I further question the adequacy of these laws from a political and social standpoint.

I am amazed at the popular misconception as to what the Missouri Basin development program will accomplish. There appears to be a feeling that a huge expenditure of Federal money in the Basin will automatically insure prosperity regardless of how the money is spent. Some people pretend to believe that the program will eliminate droughts, floods, blizzards, and grasshoppers. People of high standing have been led to believe that construction of reservoirs in the upper part of the Basin will almost entirely eliminate floods in the lower river. They consider that the upper states are making considerable sacrifice for states in the lower part of the Basin. As a matter of fact, if all the reservoirs planned outside of Missouri and Kansas were constructed, the people in the lower part of the Basin would find it difficult to notice any difference in floods. I say this in spite of the large flood reductions that have been accredited to the Fort Peck Reservoir. Any honest engineer who knows anything about the hydraulic characteristics of floods would not claim that a given reduction of peak flow at a certain reservoir site would carry undiminished for hundreds of miles downstream.

There is widespread misunderstanding as to what a soil conservation and improved land management program in the Basin can accomplish. The major physical benefit from a good land management program accrues to the land on which the program is placed and not from any off-site benefits. I wish to repeat that statement. The major physical benefit from a good land management program accrues to the land on which the program is placed and not from any off-site benefits. If there were a hundred percent participation in an optimum land management program throughout the Basin, the effect on floods in the lower main stem of the Missouri River

and its major tributaries would be so small as to not be measurable. There are technical computations and results of research which will verify this but which I do not have time to elaborate on here. Please do not get the impression that I am opposed to such a program. I strongly recommend that an improved land use program be initiated, or perhaps I should say accelerated at the earliest possible date. I urge this because of the great benefit such a program would be to the land on which it is placed and not primarily for any off-site benefits it would bestow.

Some experts, in their enthusiasm for "holding the water where it falls," may run head-on into state water laws in the upper states of the Basin. Some of the water they expect to trap and use where it falls may already be allocated by law to downstream users.

The destructive effect of silt on some of the large reservoirs planned and under construction should not be minimized. However, I find that the seriousness of this problem is frequently very much exaggerated. As far as possible, soil should be retained in its original position on the land. Beyond this point, it is frequently more economical from every point of view to trap it in large reservoirs than it is to install costly supplemental works to keep it out of the reservoirs.

Perhaps this paper has been pointed too much toward criticism of the Missouri Basin Development Program without much of a constructive nature. However, the magnitude and economic implications of the program seem to call for all the honest and straightforward thinking of everyone. I feel that we have not done enough of this. The Missouri River Basin Program, if properly planned and executed, can be of tremendous benefit to the national economy. The mere expenditure of federal money will not insure its success. Unless the states and the people of the Basin recognize and assume their responsibilities rather than depend entirely on the federal government, the program will be a miserable and costly failure. The economy of a region depends on the resources of that region and how fully and wisely the people use those resources. Government can provide some stimuli and assistance, but beyond certain limits, it is ineffective. It is ultimately up to the people of the Basin to "carry the ball."

NEW DIRECTIONS FOR LAND ECONOMICS RESEARCH: WEST

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TWO related but dissimilar approaches to this discussion are available. One—the more usual—rests on advancing a formal definition of land economics in order to distinguish it from other fields of the parent discipline “economics” and to follow this definition by a break-down of land economics into sub-fields with a listing of research needs under each sub-field. In such an approach, fine-spun distinctions with hazy boundaries are common and terms such as “land utilization,” “land classification,” “land settlement” and the like, the content and meaning of which are nebulous and more conducive to argument than to agreement among research workers, will be found liberally sprinkled through the discourse.

The other approach—the one I will follow—starts with the common sense knowledge that there are distressing economic problems in our western society that have their roots in the peculiar structure of the western natural environment and in the institutions man has erected in the West for guiding his behavior in the utilization of that environment. The focus in this approach is on *problems* thus rooted in the “land” and in “landed” institutions. Whether all of them are problems that fall clearly within the logical categories that might be advanced in the first approach is totally unimportant. The problems are there; they must be tackled by somebody interested, trained and experienced in their analysis. Whether such investigations are entered into by organizational units carrying “land economics” in their title or by specialists dubbed “land economists” is solely an administrative question private to each research organization. The crucial matter is to recognize the existence of the problems that may be called “land economic” problems and to assign men of appropriate qualifications to their investigation.

The discussion that follows will be concerned with land economic *problems* peculiar to the western United States. They are problems that warrant consideration under the heading “land economic research” only because they have a common source in the peculiar

* Contribution from Montana State College, Agricultural Experiment Station. Paper No. 220 Journal Series.

structure of the western natural environment or in the institutions man has erected in the West for directing his behavior in the utilization of that environment.

Problems Rooted in the Structure of the Environment

The physical environment of the West exhibits peculiarities of great economic consequence. Much of the land economics research in the West must, if it is to come to grips with the crucial facts of the environment, be directed to such problems as these environmental peculiarities create. They will be discussed here in three categories: (1) Those problems that grow out of a fluctuating, semi-arid climate; (2) those that grow out of the peculiar inter-relatedness in production of resources located at widely separated geographic points; (3) those created by the peculiar importance of "multiple-use" of much western land.

The economic consequences of a fluctuating semi-arid climate. If the question were asked, "What single environmental condition is most characteristic of the western United States?" probably most persons would reply, "aridity" and some would add the adjective "fluctuating." Yet much of our research into the economics of resource utilization rests on "soil surveys" or on "soil and slope" classifications. Rarely, except as to areas distinguished by the amount of rainfall, do we relate our research to crucial climatic differences.

Frequently of greater importance than soil type or slope and always of at least equal importance in the triumvirate of soil, slope and climate, are such factors of the climatic environment as amount, seasonality, time, intensity, and variability of rainfall; humidity and evaporation rates; and levels and variability of thermal energy. Admittedly the shortcomings in our economic research related to climatic factors are due in part to shortcomings in the basic physical data. Probably we economists should prod the natural scientists into giving us better basic climatic data. But in the meantime we should undertake research into the economic significance of climatic phenomena. We should not hesitate to get into analyses of basic climatic data ourselves. The work begun by Dr. Marion Clawson in the variability sequences of rainfall in the West¹ should

¹ Clawson, Marion, "Sequence in Variation of Annual Precipitation in the Western United States," *Journal of Land and Public Utility Economics*: August 1947, pp. 271-287.

be carried further and greatly broadened to embrace other climatic factors, and the economic significance of the variability patterns developed should be explored.

We need to do a great deal more research on climate and the delineation of "climatic patterns." We need to investigate their economic significance; their relation to entrepreneurial risk and uncertainty; their bearing on economic stability. We need to explore means for attaining and maintaining economic stability in a region of climatic instability. How can firms "roll up and unroll" like a corn leaf to survive in the face of climatic changes?

The economic analysis of the inter-relatedness in production of geographically separated resources. Agricultural land resources in all areas of the nation exhibit a pattern in which the characteristics of the resources at one point are different from those at another point. But only in the West are these resources, though at widely separate points, commonly organized into single agricultural economic entities. In the West acute economic problems arise because the characteristics of the agricultural resources associated in a single firm are often widely variant and frequently are not combinable at all or only with great difficulty in proportions that permit maximum productivity. Typically in much of the West, the "firm" in agriculture is not a localized geographic unit. Often different types of grazing and hay lands must be associated in a single firm and geographically they may be located many miles apart. The pioneering study of sheep migration in the inter-mountain region by Hochmuth, Franklin and Clawson is a good example of an excellent start in research into this problem.²

Irrigation farming exhibits the same characteristic. The tillable area usually is located at long distances from the source of the water that may be the limiting factor in the economy of the firm. We need to investigate the economic consequences of this condition relative both to the firm involved—its risks and uncertainties, costs and returns—and to the community's and society's concern over the wastes and inefficiencies in the use of water that may arise due to this wide geographic separation.

There is a growing tendency in the West to combine irrigated and dry land resources in a single firm even though they may be miles apart. What are the economic causes and consequences of

² H. R. Hochmuth, Earl R. Franklin, and Marion Clawson, *Sheep Migration in the Inter-Mountain Region*. U. S. Dept. of Agr. Circular 624, January 1942.

this development? To what extent should public policy in development of irrigation recognize it in its plans?

The economic analysis of multiple-use of resources. Nowhere else in the United States does the multiple use of resources have the economic impact it has in the West. This condition is probably a corollary of the condition discussed just previously—that resources used by single firms are frequently not geographically localized—and is also probably a result of the extensive federal ownership of resources in the area—a condition to be discussed later. But all agricultural economists in the West recognize the complex and difficult economic research problems posed by the phenomenon of multiple-use. A single area may be used for grazing by domestic livestock and by game for the hunter, for water production for domestic use and irrigation, for water impoundment for irrigation and flood control, and for recreation. The joint, competing and complementary economic relationships are baffling and obscure but terrifically important. In the West we need, as we need nowhere else in the United States, research into the economic evaluation and the economic consequences of this phenomenon. We need research that will serve as a guide to the public agencies in making their difficult but necessary decisions as to which use or combination of uses in a given area creates the greatest economic return.

The problem is difficult. But we should not pass it by for that reason alone. Only by making a start someplace will paths through the tangle open up before us.

To summarize this section of the discussion, most of that economic research usually called land utilization, or land classification, or type of farming research should in the West be addressed to problems flowing from three significant peculiarities of the western environment—its variable semi-arid to arid climate, the widely separated resources frequently composing or required for the composition of single firms and the multiple-use of much of the West's land resources.

*Problems Related to Institutions Erected to Guide Man's
Utilization of the Environment*

Here in the West our utilization of the environment is guided by a structure of institutions basically the same as those in the United States as a whole. But they exhibit many peculiarities related to the underlying peculiarities of the environment already discussed.

Land economic research in the West should concentrate on these peculiar western institutional differences. For example, private property in land is the basic land institution in western agriculture as elsewhere. But public property in land occupies a more prominent place here than elsewhere in the country. Also, "private property" in water is a vastly different thing morphologically, physiologically, and therapeutically than is private property in the land surface. These peculiar differences in western landed institutions should be reflected in western land economics research.

Research in water rights and water law. Elsewhere in the United States we have research in "land ownership." Generally such research is concerned with the human behavior content and economic significance of ownership and tenancy. It distinguishes various kinds of ownership and tenancy and their relations to resource utilization; it describes the economic and social status of the individuals who compose the relationships; it analyzes the economic relations established between the individuals caught up in the tenure restrictions.

Here in the West private property in water is a crucial and critical aspect of our institutional structure. But research into water rights and water law in any degree comparable to that into property in the land surface is noticeably lacking. We need to devote a great deal more of our attention to describing the content of water law in terms relevant to human behavior, to research into the human behavior and human relationships that flow from water law, and to the economic analysis of water rights. We know as little about the behavioristic content and economic significance of water rights today as we did about property rights in the land surface a generation ago. If land economics research is to get hold of something vital in the West, it must tackle the "property in water" problem.

A listing of suggestive focal points for research into water rights may be helpful.

1. A description of the significance of water rights in terms that bring out their "control, liberation and expansion" of human behavior in the use of water and land surface. To whom do the restrictions and liberations apply and with what economic consequences; what are the magnitudes and costs of the risks and uncertainties of the entrepreneurs and other beneficiaries of water rights?
2. What are the inter-individual, inter-area, inter-state relations and conflicts implicit in water law? What are the inter-use conflicts of water that grow out of the content of water rights?

3. What are the "costs" of water—the "value" of water—in various situations and under various rights? What are the relations between "costs" of water and the "value" of other resources used in conjunction with water, notably the land surface?
4. What are the relations of water rights to resource utilization, to entrepreneurial costs and returns, to social benefits and costs, to efficiency in the use of resources?

In these, and in other focal points that could be mentioned, only the surface has been scratched by economic analysis—frequently the surface is unmarred. Land economic research in the West has a wide open field and a great opportunity in advancing understanding of these problems.

Economic analysis of the public ownership of resources. Nowhere in the United States is the public ownership of resources as widespread as in the West. The land area of the 11 western states is 54 percent in federal ownership; on this area is a significant portion of the supply of merchantable timber and of the grazing resources, and well nigh all the recreation and sources of water for domestic, irrigation, power and navigation uses. These cold statistics do not tell the whole story. Of more vital importance from the standpoint of research in land economics is the further fact that much of the resources on these federal lands is utilized by private entrepreneurs for their private profit. Here is another of those situations peculiar to the West—publicly-owned resources utilized by private enterprise. Where, elsewhere, land tenure research has been concerned with "landlord-tenant" relations—meaning always *private* landlord-tenant relations—here in the West this problem is predominantly one of *public* landlord-private tenant relations. At first glance by the uninitiated, this would seem to be a distinction of academic importance only. But upon analysis a host of intriguing differences come out that lead one almost to the conclusion that it is a wholly different problem.

Just what is and, of equal importance, what ought to be the landlord-user relation between the public agent and the private entrepreneur? What are the freedoms and the restrictions placed by the relation on the behavior of the public agent on the one hand and on the private user on the other? How is the relationship established and maintained? What are the "risks and uncertainties" experienced by the private entrepreneur and by the public administrator? What are the economic consequences to the private entre-

preneur on the one hand and to the public on the other? How can the relationship be established and maintained to the maximum benefit of all parties concerned?

Strictly from the standpoint of the economics of the firm, the problem presents intriguing facets for study. What is the economic impact on the dynamic planning of the firm of the risks and uncertainties peculiar to this different kind of landlord-tenant relation? What economic consequences on entrepreneurial decision, on the combination of resources in production and on the value of privately owned resources flow from the fact that "rents for grazing" on federal lands are administered prices rather than competitive market prices? On the other hand, how can the interests and values of other users of the services of the same land and the interest of society in the maintenance of productivity of the resource be adequately protected?

Research in this field has barely commenced. Little if anything was done on it before two years ago. Now the Western Agricultural Economics Research Council is sponsoring a regional research study of the problems of "public land management" in the West. To date California, Nevada, Utah, Colorado, Wyoming, and Montana and the Bureau of Agricultural Economics have expressed a keen interest in undertaking research in this field. Work has actually commenced in California and Utah.

Another aspect of the problems growing out of the public ownership of land in the West is the impact of public ownership on the fiscal condition of local governmental units. Where and under what conditions does federal land ownership place a fiscal burden on local government? Where and under what conditions does it aid local fiscal conditions? What arrangements might enhance the favorable and reduce the unfavorable effects of public land ownership on the fiscal condition of local units of government?

Economic problems of settlement on new irrigated land. Vast new areas of irrigation are either now opening up for settlement or are planned for the near future under extensive "river basin" development programs in the west. Perplexing questions related to the financing of such settlement are unanswered. Traditionally on federal projects, the government has placed a tract of raw land in the settlers' hands and installed the facilities to deliver water to the high point on the tract. From there on, clearing, levelling and subjugating the land, erecting buildings and fences, putting down

wells, constructing "on the tract" irrigation works, equipping the place with machinery and livestock and providing a livelihood for the family over the few or many years that all of this may take is the entire responsibility of the settler. Either the settler must come to the project pretty well heeled financially or it means a serious burden of debt. Or the finally "successful" settler may have benefited from the investments of time and money made by previously "unsuccessful" settlers. As in all such situations where heavy investments are needed, the pressure of interest charges and the risks and uncertainties of debt operating either through the unwillingness of creditors or the reluctance of debtors or both, results in an uneconomic limitation on investment. Such limitations on investment often accrue to the detriment of the settler and the public through uneconomic production and slow repayment of irrigation costs. The question posed is what sources, kinds and amounts of credit are best adapted to the job. Government development before the settler is put on the tract? Direct government loans for development? Private loans guaranteed by the government? Or should we go ahead in the future as in the past? Comparisons should be made between irrigated areas where various means of financing have been used. Comparisons are particularly possible between no development and full development because full development was practiced on the Wheeler-Case projects constructed before and during the war whereas no development has been traditional on Bureau of Reclamation projects.

These are the new directions for land economics research in the West. The starting point for these new directions is any socio-economic problem arising directly from the peculiarities of the physical environment or from the institutions erected for guiding use and enjoyment of that environment.

SOME NEW DIRECTIONS OF LAND ECONOMIC RESEARCH IN THE NORTHEAST

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THE directions of research discussed in this paper concern problems associated with:

1. The "urbanization" of the open country.
2. The retreat of the extensive margin of arable farming.
3. The geographic localization of farm income differentials within areas suited to farming.

The first of these phenomena is relatively new in many areas. The other two are older, but research methods and ideas for meeting problems are changing.

The "Urbanization" of the Open Country

I refer here to problems arising from the development of a non-farm segment within open-country populations. Issues raised by concentrated urban expansion along rural-urban fringes are not included. The urbanization of the open country is less spectacular, but has far reaching implications. In New York and a number of other states a majority of the working people in many rural communities are not employed on full-time commercial farms operated under their own direction. A large number of these nonfarm people are employed in manufacturing, trade, and service industries at the present time. When these employment opportunities contract, many of them will be in the same position as similar workers in the cities. Some hope that a small acreage—often of poor land—can provide them protection against a depression. Most will be disappointed, as they have been before. Full-time commercial farming no longer is a business one drifts into and out of in response to variations in an off-farm job.

Most nonfarm open-country residents live in an economic world distinctly different from that of their farmer neighbors. They are, nevertheless, a real part of the rural community. They own part of its tax base, drive over its roads, send their children to its schools, and share generally in the community life. Many of them were raised on farms, so they are at home in farm surroundings even though they are no longer in the farmer's economic world.

How can people in different economic worlds live together in social harmony and economic justice under these circumstances? How should they share tax burdens? How can agricultural service agencies serve part-time as well as full-time farmers? What urban service agencies might extend their activities to rural people in the urban economic sphere? How can the nonfarmers, especially the "agriculturally disinherited" among them, be made aware of the difference between farming to reduce living costs and farming that can compete on a commercial basis? How can everyone be made to realize that the gulf between the economic worlds of nonfarmers and farmers is wide, even though both call the same community home?

These questions indicate an area of research opportunity. Not all of it lies in the field of Land Economics, but a share of it is here. The area is not an entirely unexplored one. There have been studies of rural community adjustments to urban influences, of the relative merits of urban and rural homes for city workers, and of part-time farm operations. The subject needs to be re-examined, however, from broader points of view. Studies now are under way to identify and count the members of important segments in the open-country population. This is the first step and one that cannot be by-passed via Census data. Recent publications report such counts in New York and Illinois. In parts of four scattered counties in New York only one-quarter to one-third of the open-country residents operate full-time commercial farms by even a liberal definition. The Illinois publication reports that in one southern county of that state only one-third of the household heads in the open-country are employed solely in farming. These studies are a beginning in a potentially important area of investigation.

The Retreat of the Extensive Margin

Experience indicates that land abandonment is a continuing process in the Northeast. Observation indicates that we have not solved the problems raised by this process where it stood ten years ago. These problems are quiescent now because of economic forces outside our direct control. They certainly will be outlined in bolder relief in the near future, and we will be worrying again about the fate of some of the identical parcels of land so much discussed last time.

The abandonment of land once used for full-time commercial

farming in states like New York appears to be much less the consequence of soil erosion, mistakes in land settlement and farmer ignorance of optimum factor combinations than the consequence of technical and scientific progress. This progress has increased yields most where yields already were highest and cut costs most where costs already were lowest. It is an accident, perhaps, but in this part of the country, progress has not greatly disturbed the relative economic-opportunity positions of various grades of land. It has stretched, however, the range of the economic-opportunity scale. We can reasonably expect a continued stretching of this scale in the Northeast, and expect land as well as agricultural workers to be technologically displaced in the future.

Some claim submarginal land does not exist. This is quite possible in pure logic where the land market is made perfect, where there are no skewed distributions in command over capital, where buyers and sellers of land are omniscient, and where taxing processes operate ideally. In the real world, little land that has passed by default from fulltime commercial farming can be used by private individuals in any way now known to obtain going rates of return on normal investment and labor. I am forced in honesty, however, to say that most of the abandoned land is in private hands today and that most of the taxes on it are paid in full. Whatever in the way of an economic skeleton still exists (outside of the houses) is supported in a large measure by capital replenishment from outside. It is when this replenishment stops, as it must in a depression, that submarginal land problems reappear.

What is to be done? The biggest job is teaching people the nature of the land abandonment process. It is easier to explain nuclear fission to many persons than it is to explain land abandonment—they have fewer preconceived notions about nuclear fission. Men believe in the land they live by, even though they do not live by it very well. They also find it difficult to concede that new machines, plants and animals, by which poor land can be made to produce more with less human effort, can make that land worth less on the economic scale. These things can be taught, however. We also can teach the techniques by which differences in land can be identified and their significance spelled out. The teaching of these things can help to dry up the capital replenishment that supports misguided attempts at farming, and supports artificially high land values and taxes, in what are now submarginal land areas. This, perhaps, can

open the way for the economic development of these areas by private forest, grazing, and other extensive land using enterprises. Then a claim for the non-existence of submarginal land can hold a greater share of truth than it does now.

Research can explore the economic possibilities of alternative abandoned land uses, examine alternative institutional arrangements affecting private enterprise on this land, and consider public enterprises that might be established in these areas. It has been recommended more-or-less as a matter of course that abandoned land be returned to forests, without a careful investigation of the economic returns promised by forestry. Forestry has been promoted as a religion rather than on the basis of hard economic facts. As a religion it has made meager progress in comparison to its potentialities. Economic facts may reveal the bottlenecks. Grazing, recreational and other extensive uses also can be investigated.

The Localization of Farm Income Differentials

Research to discover reasons for variability in incomes from farm to farm was begun in this country some years ago. It probably was recognized ahead of time that the functional relationships underlying this variability are very complicated. Progress has been made however, and various patterns of stochastic causal and associative relationship have been discovered. One of these patterns is geographic. Farmers in certain areas have been found generally to be making higher incomes over the years than farmers in certain other areas. It also has been found repeatedly that these income patterns often are associated with geographic patterns in such physical factors as soil, climate, topography, and location.

The land classification system now identified with Cornell University grew directly out of these findings in farm management research. This system has as its fundamental supposition the generalization that there are geographically localized differences in farm incomes within such areas as states and counties, that these are mappable at a reasonable level of categorical and cartographic detail, and that they persist long enough to give these maps a sufficiently long useful life to justify the cost of making them. It has as a closely related supposition the idea that localized income differences are associated with physical land differences. Numerous operating assumptions also have been necessary. These also have been based upon farm management research findings. The use of

the roadside farm appraisal (the widely known, so-called building classification) has involved one of these operating assumptions. In this case it is assumed that the evident appearance of a farm and its buildings is related to the income of the farmer. The fundamental suppositions establish the general character of the classification system. The operating assumptions are used in carrying out the classification processes involved in the system. Operating assumptions may be changed or replaced within limits without changing the essential character of the system. Actually, however, the distinction between fundamental suppositions and operating assumptions was not clearly recognized early in the classification work.

A variety of farm characteristics always can be found in any area that are related, causally or otherwise, to farm income. In New York State intensity of land use, as inputs per acre, is one factor generally related to farm income. There are others similarly related, but as it happened, intensity was chosen early in the classification work and explicitly advanced as the classification criterion. Among the other farm and land characteristics that are related to past and probable future incomes in various degrees, a group was chosen that offered the advantage of being easily ascertainable, usually on rather rapid visual inspection. These were termed the "bases" of classification. They included principally the outward appearance of farms and farm business, kinds of crops and other vegetation on the land, soil characteristics, and assessed valuations. These particular farm and land characteristics were found to be suitable indicators of farming success in the areas of the state where classification work was begun and were made a part of the classification routine on that basis.

Fundamental suppositions, criterion concepts, and operating assumptions were confused with one another in the standardized classification routine that crystalized out of the early classification efforts. This routine was adequate in the areas where it was born, but is not suited to all major areas of New York. It is unsuited, moreover, to many areas outside New York, and workers elsewhere often have been unable to separate from it the ideas that might have been useful to them.

Regardless of the deficiencies we think we see today in the original form of the system, it, nevertheless, was outstandingly successful in the circumstances where it first was applied. It was simple, and at the same time portrayed differences farmers them-

selves could see when they stopped to look. I think this relatively simple device has contributed more to a general understanding of land use problems in New York State than any other single activity. The system also represented a fundamental departure from established land classification systems at the time it first was advanced and for this reason it stimulated basic thinking about land classification. Up to that time no major classification system had discriminated among levels of economic opportunity within major use areas. This feature of the system still seems to have no meaning to some land economists. I shall attempt later to show how an acceptance of traditional theories of land use and farming returns can cause a blind spot in one's comprehension at this point.

The recent re-examination of the system by workers at Cornell was prompted by the apparent unsuitability of the original routine in certain areas within the state and also by a desire to spell out the fundamentals of the system in a manner more widely applicable and understandable. In this they have drawn heavily on the work of men who have applied the fundamental ideas of the system to a variety of conditions both in the United States and Canada. Workers in Virginia, Canada and the State of Washington have contributed especially. Attempts also are being made to tie the system into traditional theories of land use and farming returns. This can provide logical shoring for inductively derived notions and a linguistic common denominator for those who approach land problems from established theory and those who approach them via the everyday problems of farm management.

As visualized now, the land classification methods being used at Cornell have more in common with farm appraisal techniques than with any other clearly identified process in this general field. The methods and the thinking go well beyond a mere estimate of probable sale price, however. They go into that area where lie part of the factors determining such things as debt repayment ability. In this respect, then, an application of the system parallels the work of a qualified loan representative, who not only estimates sale price, but also recognizes farm income differentials that lie beyond this. The land classifier, of course, tries to visualize a farm in terms of a farmer typical of the area, rather than to evaluate the ability and integrity of the individual farmer. His appraisals also are much more hasty and his results are recorded in a categorically and

cartographically generalized form. The intent is much the same, however. In fact, the land classification system now is referred to as an income-expectancy type of classification.

In this form, the large judgment element present in the system is obvious. It can be judgment objectively exercised, however, and surely is judgment in an area of immediate practical concern to farmers, farm lenders, agricultural service personnel, governmental agencies, and many others. With judgment elements clearly recognized and with fundamentals separated from expeditious adaptations, it is possible to critically analyze the system and to outline directions of thinking and research that offer promise of improving it. It is possible also to visualize the likely usefulness of the system in new circumstances.

First, however, we should clear up some inconsistencies between the fundamental suppositions of the system and established economic theory. As always, we must accept the theorist's disclaimer to exactness and complete generality. We must hold him, however, to portraying central tendencies in stochastic relationships through time and space, if he means to have his theories approximate real world situations. With this central tendency idea in mind, we can say that traditional theory categorically denies the possible truth of both the principle and associated suppositions of the income-expectancy system of land classification. In traditional theory, land either is made a residual claimant, or is attributed a marginally imputed share. In either case, non-land input factors are assumed to be mobile in varying degrees and to seek maximum returns across land grade lines. It is presumed, then, that these factors in time attain a substantial degree of equality in returns for equal input effectiveness everywhere they are employed. Types and intensities of land use are adjusted to equalize marginal productivities for all inputs in all directions of application. The land market capitalizes the share left for, or imputed to, land in establishing the market price of this input factor. All dollars invested in land at going market prices thus earn equal rates of return everywhere. In this body of reasoning, then, a farmer should receive neither more nor less for either his time or his capital than any other farmer, unless his time or his dollars are more or less effective input factors.

This theory leaves no place for persistent geographic localizations in farm income differences, except under some rather far-fetched

assumptions. The most often promoted assumption of this kind maintains that geographic differences in farm incomes within most limited areas are the consequences of geographically localized differences in the managerial abilities of farmers. There are both empirical and logical items of evidence to refute this notion. The idea appears especially out of place when one leaves the marginal zones and makes comparisons between high and very high farm income areas. Similarities in cultural and educational backgrounds, intermarriages for that matter, seem to rule out the likelihood of inherent differences in farmer abilities. If the differences are acquired, then there must be an external cause. Even not acquired there may be a sorting of managerial ability by grade of land. But why should differences in managerial abilities become localized without an external cause? If, indeed, economic opportunities are the same on all land, why should the more capable farmers gravitate to areas where soils are deeper, and the land naturally better drained, better watered, less steep or otherwise physically better suited to agricultural operation?

Actually it seems quite meaningful in the real world to consider the price a farmer pays, or promises to pay, for his farm as going a long way toward determining his degree of subsequent financial success, and then to focus attention upon the characteristics of the land market and of the participants therein. The land market comes far from embodying a theoretically perfect process, its participants are far from omniscient, and they come to it on widely unequal footings. Most farmers do not possess sufficient knowledge of land over wide areas to justify a contention that the prices they establish in buying and selling farms represent an accurately capitalized value of any explicitly recognized return. They do recognize some differences in land to be sure, but there are good grounds for expecting them to underestimate the actual differences and therefore to average their prices across land grade lines to a considerable extent.

There also is a highly skewed distribution in command over capital among farm purchasers. Many people have the price of a cheap farm, but few have what it takes to buy a high priced one. Almost certainly this skewed distribution in command over capital causes more intensive bidding at the lower end of the price scale.

Lack of complete knowledge and a skewed distribution in command over capital combine with desires to be "one's own boss" and desires for security, to produce an actual land market that is far

from the theorist's ideal. The discrepancies between the actual and the ideal follow a generally systematic pattern, however. They are such that degree of financial success in farming very commonly is an increasing function of land price. There are definite limits, however, to the generality of this relationship. Where differences in land are sharp and clearly recognized and where capital is equally available to the groups on each side of such land lines, this relationship ceases to hold. For this reason we often find equal economic opportunities between highly priced land areas in irrigation districts and cheaply priced lands in grazing areas above the high-line ditch. For this same reason, too, we find roughly equal average opportunities in farming between Wyoming and New York. Land in Wyoming is not confused in any buyer's mind with land in New York, even though land within either state may be confused with land farther down the road.

It is in this general fashion that the income-expectancy system of land classification is being tied into established theory and given logical support.

With this background let us turn to thinking and research that might improve the present income-expectancy system of classification. The following are possible directions such thinking and research might take:

1. Toward a more precise expression of what is meant by income expectancy.
2. Toward a re-examination of the suitability of various easily observed or measured indicators of income, toward a quest for new indicators, and toward refining techniques for stepping from indicator information to income estimates at the individual farm level.
3. Toward more precise technical definitions of land classes as cartographic groupings of farms.
4. Toward more systematic procedures for drawing the land class lines that create the cartographic groupings of farms, and toward devising and applying more refined statistical techniques in measuring the "goodness" of a given set of lines and in maintaining uniformity within land classes among widely separated areas.

The making of income-expectancy land class maps will remain a judgment process, in large measure, regardless of the thinking and research that is done. The classifier must add up a large

amount of information that can never be summed reliably in any mechanical manner. He also must look into the future if his work is to be most meaningful. Judgment processes can be ordered and aided, however, and the kinds of activities suggested above would help in this way.

Farming returns, and therefore farm income expectancy, can be measured in many ways. In land classification work the particular measure adopted may vary with the objectives and circumstances. In an area where farms are predominantly family-sized and owner-operated, the farm management measure known as "labor earnings" is likely to be appropriate. For land classification purposes, however, such a measure should be modified to span a period of years, perhaps the ordinary working life-time of a farmer. Generally, the measure chosen should be one whose values will be closely correlated with such things as debt paying ability and general level of living. For special purposes and in certain circumstances labor earnings per man would be a suitable concept. Other concepts may be appropriate in other instances. A "typical" or "modal farmer" concept also must be part of any expression of what is meant by income-expectancy. We do not classify land for specified individuals but for the "most likely" individual.

In any case, however, the land classifier will not often be able to measure even actual past incomes in the areas he classifies. He seldom has the money. Instead he must use easily observed or measured indicators. The appearance of a farm is such an indicator. Soils can be indicators; so can kinds of crops, size of farm business, rates of production, market value of capital, and other farm and land characteristics. These factors possess indicative value to the extent of their correlation with long-run incomes. They need not be causally related to income to be useful in the classification process. Their relationship to income need only be stable in a known space and time. It is obvious that some indicators are likely to be more satisfactory than others. The usefulness of an indicator depends on its cost, on the one hand, and its closeness of relationship with long-run incomes, on the other. An adequate interpretation of indicator information of any kind must rest upon a knowledge of regression functions. These regression functions need not be continuous and precise, but they must make it possible to put individual farms into significantly different income-expectancy categories.

At present there are no technical definitions of income-expectancy land classes. It will be very difficult to construct such definitions. Land classes are cartographic units and each unit nearly always must contain the full range of universe values if it is to be of reasonable size and not unreasonably awkward in shape. Land classes can be distinguished most meaningfully in terms of various characteristics of frequency distributions. They should not be distinguished exclusively in terms of one characteristic of these distributions—the arithmetic mean, for example. I believe that the task of defining land classes in technical terms offers a real opportunity for imaginative thinking.

The development of systematic procedures for drawing land class lines is an even more difficult task than the construction of land class definitions, though closely related thereto. It is strictly an art at present, even when individual farms have been assigned to suitable categorical income-expectancy classes and the corresponding designations noted on maps. In drawing these lines attention must be given to the spatial distribution of farms with different characteristics, as well as to the kinds of frequency distributions shown on the tabulator when the job is finished. Statistical measures can be used as partial tests of the goodness of a classification and may replace to some extent a need for systematic procedures in the drawing of lines. No statistical measures yet known, however, can reflect satisfactorily the spatial element.

It is possible to visualize a more "scientific" income-expectancy classification of land (perhaps we should say, of farms), but there are plenty of unsolved problems along the way.

I should not close this paper without pointing out explicitly that the income-expectancy system of land classification is not the long sought ideal that does all things for all men in all circumstances. There are instances where geographically localized differentials in farm incomes do not exist in a mappable pattern, cases where dispersed non-contiguous operations make mapping on a farm unit basis impossible, cases where major use issues are paramount and must be settled before any persistent pattern of incomes will crystallize, cases where institutional arrangements constitute the most significant limiting factors, and cases where the problems at hand involve helping a population on the land keep body and soul together in an unfavorable situation from which it cannot escape. In a number of widely separated areas, however, the system has

proven valuable. Maps made with it have helped many private individuals and organizations directly and have helped others indirectly by serving as guides in the formulation and promotion of governmental programs and policies. Such maps can help solve a general problem in so far as lack of information underlies differentials in economic opportunity upon the land.

Is the making of these maps research? I will side-step this by saying that a land classification program of this type often can form an important part of a departmental research program. It can identify significantly different strata for sampling purposes and it can aid materially in constructing the kinds of observational designs that are beginning to be suggested in farm management and related fields. It also can form a nucleus around which it is possible to organize ideas of what constitute optimum combinations of factors of production on various lands.

DISCUSSION

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Bureau of Agricultural Economics

Professor Conklin says that land economists in the northeast will be concerned with problems related to the urbanization of rural areas, retreat of the extensive margins of agriculture, and with land classification. Let us not condemn too readily the urban employee for wanting to live in the country. Although social security has improved his economic position, his real problem is that of maintaining urban employment rather than proper adjustment to his rural environment. He may need some help in understanding the limitations and possibilities of his part-time farming venture.

From Professor Conklin we have again heard about the "Cornell land classification system." (The fact that it is a farm classification system he parenthetically admits.) Drawing lines on a map around areas of good farms and around areas of poor farms may be a desirable starting point for research in land economics. Such a procedure graphically illustrates the occurrence of certain observed characteristics in much the same way that a bar chart graphically portrays the occurrence of items in a statistical array. The delineation of areas having certain characteristics is valuable for extension work and for other purposes. We do not need, however, to rationalize the making of a bar chart by referring to economic theory. It does not take a theorist to observe that some farmers have high incomes and some low even when the observation is made by visual inspection of his buildings or other assets rather than by an accounting system. It may take a good theorist, however, and painstaking research to discover why some farmer's incomes are high and others low.

Perhaps a fruitful way to consider what is new in land economics re-

search, at least in the West, is to consider the major trends in land use and landed institutions. In the West we have seen a rapid expansion of irrigated land in recent years and will see further expansion in the near future. Secondly, we have seen in recent years much greater control exercised over our public and private range lands and in the near future I think we will see a much more intelligent and intensive use made of them. These two major trends in the West should be of primary concern to land economists.

In the field of irrigation, land economists have much to do. We must study further the economics of organization and operation of irrigation districts and other institutions peculiar to irrigated farming. This list is not at all exhaustive. There are many other problems that need attention.

We have much to do in the field of the economics of range land use and control. Experiments to determine how we may practically increase the production of feed from range lands are of fairly recent origin. These experiments are showing rather startling possibilities. The economists have much to contribute in helping to determine how we can use range land more intensively. Problems of ranch organization and management are involved.

Land economists in the West must be aware also of the fact that government, all levels of it, is a more direct factor in the economic environment of western agriculture than in other regions. It is not uncommon for a western producer to deal with one or two or more government agencies to obtain grazing for his animals; he deals with another to help him control predators. He irrigates his land with water, the right to which is protected by the state. This water is brought to his place by a municipal corporation which collects for this service through the county taxing mechanism. This municipal corporation may, in turn, receive the water from a federal project or a public corporation. It is evident that the actions of government are a vital and determining force in western agriculture, as vital perhaps as the prices received and costs incurred in production. A new direction in land economics research would be to develop techniques for properly evaluating this factor in our economic analysis.

DISCUSSION

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In my discussion of these excellent papers I want to direct my remarks to making land economics research useful. In organizing and carrying out any research project many things can be done to facilitate the utilization of the final results. It is necessary to develop a clear idea not only as to *what*, but also as to *whose*, problems we are tackling; in other words, whose land use interests are involved and who the users of anticipated research results will be. This helps focus the analysis and aids in selection of illustrative materials that will appeal to the users.

Participation by people who live upon and use the land is of great im-

portance. As prime movers whose initiative and cooperation is essential in any program of land use adjustment they have an important layman's contribution to make in identifying the problem and assisting with certain phases of the study. I wish to emphasize this point above all others in these comments of mine. A close, progressive, working understanding between the man of science and the man of the soil is, I feel, of fundamental importance in paving the way for the utilization of research results.

In passing it is important to note that land economists can very properly carry on some research for the purpose of improving their own science; for example research work regarding such things as land classification, land valuation, the application of theories of location, and the character of institutions affecting land use.

Both papers stress the great importance of basic physical data. One of the fine things about the income-expectancy classification discussed by Dr. Conklin is its careful tie-in with soils and other resource data. Dr. Kelso's proposal for studies of the economic consequences of a fluctuating semi-arid climate should yield very useful information. Men everywhere in the West are intensely interested in the weather and its bearing on problems of risk, uncertainty, and economic stability. I feel that we need much more information on soils, especially expressed in terms of potential productivity under alternative soil management plans.

I was much interested in Dr. Kelso's discussion of the inter-relatedness of geographically separated resources. The factor of distance is important but so is the factor of *pattern*; the many area combinations in which resources occur. His suggestion for research into this problem in terms of agricultural operating units is an excellent one. However, since agricultural uses are often intermingled by areas and geographically with non-agricultural uses, an analysis of agricultural operating units might well be accompanied by an economic analysis of non-agricultural uses. I wonder if land economics research doesn't often neglect the economics of forest, grazing, recreational, and watershed use. Dr. Kelso in his discussion of the need for economic analysis of multiple-use resources, and Dr. Conklin in his discussion of important research opportunities in exploring the economic possibilities of alternative abandoned land uses point out this shortcoming quite clearly.

Recognition of legal institutions as factors affecting the use of land resources is most properly emphasized in Dr. Kelso's paper. An economic analysis is much more useful when accompanied by an analysis of the institutional framework within which economic activity is carried on.

Regarding the economic analysis of public ownership of resources I wonder if it wouldn't be more feasible to look upon the whole tenure structure as a *combination of public and private rights* and to analyze both types together. I feel that the goal we seek is a good combination of public and private use rights. The necessity for such a combination grows out of the varied character of our Western land resources, the natural overlapping of private and public interests at many points, and the natural, desirable, and inevitable intermingling of two or more types of use in many areas.

I was much impressed with Dr. Conklin's discussion of an income-

expectancy type of land classification. He indicated that this relatively simple device has contributed more to a general understanding of land-use problems and land economics processes in New York State than any other single activity. This indicates that this procedure is a useful reconnaissance way of looking at farms and at land in a systematic manner. I am familiar with a similar classification made in a number of Washington counties and I am certain that the maps and accompanying descriptions made there have been an eye-opener to many who were not aware of the great variation in soils and farm income from area to area.

Dr. Conklin makes a statement to the effect that the income-expectancy system of land classification is not the long sought ideal that does all things for all men in all circumstances. This leads me to make an observation of my own, namely that any one general land classification procedure, like any one general economic theory, is often inadequate or unsuited to a particular problem situation. I am inclined to look upon land classification as a type of tool the design of which must be varied, sometimes radically, to fit the *time* and the *place* and the *problem*. I feel, too, that any economic classification map is apt to be a broad generalization based on many types of information. Any generalized land classification map needs to be explained in terms of soils maps, type of farming maps, land use data and other types of specific information on which the generalization is based.

Dr. Conklin's discussion of the need for bringing up to date our knowledge of the urbanization of open country areas is certainly timely and his list of questions is an excellent one. This urbanization development is not peculiar to the East; we have Western versions of it in the Pacific Coast States; here in the Rocky Mountains, and even in desert areas in the Southwest and the Great Basin. I have long felt that we are too prone to divide the economic universe into two big subdivisions, "agriculture" and "industry," and to overlook a broad middle zone of economic activity and living that is some mixture of the two.

I agree with Dr. Kelso that the economic problems of settlement on new irrigated land are going to need a lot of attention. His discussion is largely in terms of public policy and program problems of financing development. In addition, as he indicates, there are many farm organization, farm management and family living problems on individual farms. Some progress has been made, some excellent research work has been done, but we still have a long way to go.

In reading the papers given here and in reflecting on the scope of land economics, I am much impressed with the fact that land economics is indeed a social science; perhaps the most social of them all. I say this because of the number of other disciplines with which the land economist is constantly in touch—ecology, farm management, sociology, political science, public administration—to name major ones. I understand that the modern trend throughout the world of scientific scholarship is to try to bring workers in the various fields of science into closer working relationships with each other on a team work basis. If this is true, then there is in land economics a point of view, a method of operation, and a background of experience that is very much in tune with the times.

DEVELOPING AND APPLYING PRODUCTION FUNCTIONS IN FARM MANAGEMENT

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PRODUCTION functions are being discussed with increasing frequency in economic and related literature. Actually, economists are adopting new terminology to express old ideas. In the mathematical sense, a function is simply a description of the definite relationship that exists between variables. Research in farm management has long been aimed at the discovery of such relationships. Outstanding examples are the studies in the 1920's by Dr. Spillman of the relationship of crop yields to fertilizer applications. Later, the pioneering work of Tolley, Black, and Ezekiel initiated input-output studies covering many problems. Dr. Jensen and co-workers in the field of dairy husbandry made a major contribution with their research on the relationship of milk production to feed intake. These studies and countless others, whether they used the terms production coefficients, crop and livestock response, or input-output ratios, all sought to establish relationships between variables so that prediction might be made with greater certainty.

Adopting the terminology of production functions has several advantages. As mathematics becomes a tool of the economist in the expression of ideas, it is helpful to adopt the definitions of that discipline. A common language assists in comprehension and solution of problems. Mathematical manipulation of a function is possible and leads to greater precision and facility in the use of cost curves. Total, average, and marginal cost concepts can be expressed and integrated. When the interrelationships of several variables upon a dependent factor is studied, graphics can no longer serve and the function equation must take its place. More and more often, production economists are asked to evaluate response when the influence of several factors are felt simultaneously.

Production functions are useful at several levels in farm management research. In the phase of agricultural policy that affects agricultural production, functions can be used to summarize the relationships between aggregate factors. This knowledge could be helpful in determining the impact of policy and the adjustments that might occur on farms, between farms, and between areas. Some attempts have been made to develop production functions

showing the relationship between organizational characteristics and farm output for groups of farms. Heady, Tintner, Brownlee, and associates at Iowa State College have published several papers dealing with this level of use. The most common level has been one concerned with crop and livestock response to variable conditions. Most of this work is well within the scope of the physical production scientists. Examples of such research are familiar to all and need not be elaborated here.

In farm management research and extension at Connecticut, we have taken the position that it is at this latter level—physical production response—that production functions can be of greatest help. True, such research lies within the technological sphere, but therein may be one of the greatest benefits. Farm management may be considered as an integrating vehicle for physical production data. By the application of price or cost information, input-output relationships can be appraised to determine combinations that will achieve given ends—efficient resource utilization or profit maximization within welfare considerations. Cooperation with the physical scientists helps to indicate to each group the problems and needs of the other.

The decision stems also from another tenet—that the grouping of farms on a type-of-farming, type-of-enterprise, size-of-business or any of the familiar bases used in farm management has generally failed to give help to individual farmers in their management problems. Efficient resource utilization, within the framework of the limitations that exist on each farm, cannot be achieved by resorting to the factors-affecting-farm-profits approach derived from group data. Across-the-board recommendations to increase crop indices, to decrease investment per animal unit, to enlarge the size of business, and the like, are in opposition to primary principles in economic theory and underestimate the individual management problem.

It was on somewhat similar grounds that we chose not to use production functions descriptive of organizational characteristics from groups of farms. If these functions are used to initiate adjustments on individual farms, the same criticism can be made as of the factor-analysis approach which tends to recommend the general application of specific management practices.

Farm management as a science and an art is a much more subtle problem. It is a tremendously personal problem, too. Each situation

is filled with human and environmental conditions that border on uniqueness. Yet if we assume rational action, we have available the economic theory and the mechanics to help meet this problem. Using physical production functions as our building blocks and applying price or cost data, it is possible to synthesize economic models. After they have been altered to meet real limitations that may exist on a particular farm, the models can serve as goals or objectives that indicate possible directions of adjustment. Also indicated are the changes that are necessary in resource organization and use, an approximation of the costs in terms of expenditures, an estimate of returns, and the impact upon personal value systems and existing habits. We believe such a program brings help to the individual farmer in his role as an entrepreneur. Alternative opportunities are set up and with each is associated the management practices that are required and the returns and costs in monetary and human values. With this knowledge each operator is then able to choose which alternative maximizes returns within his value system.

Having defined production functions and discussed their usefulness in general, and in particular for farm management research and extension in Connecticut, perhaps it is time to make a major confession. In my opinion, adequate physical production functions are not available now nor will they be in the reasonably-near future unless there occurs a marked change in agricultural research. Research on farm problems has been done at scattered points throughout the country. Scientists working within this framework have naturally worked on those problems of greatest interest to themselves and to farmers in the area in which they are located. As a result, spotty coverage has been given farming problems. Moreover, because of our propensity to classify and order, institutional segmentation has been established. Problems have been viewed in segments much as the blind men "viewed" the elephant. Agricultural engineers have been primarily concerned with structural strength of a barn, a silo, or a piece of haying equipment. Dairy husbandrymen have considered hay or silage from a feeds or feeding standpoint. Agronomists have attempted to develop more useful forages. These approaches are necessary and desirable but what is lacking is an integrated research plan. Lost somewhere along the way is the problem that transcends all others—the use of farm resources to achieve maximum profit.

Because of deficiencies in sampling, experimental design and control, and analysis, only fragments of input-output curves have been developed, and these fail to show the interrelationship of important variables. Practically none of the studies have pushed experimentation to the point where total output levels off at a maximum with continued application of inputs. Progress is being made in research on technological relationships, however, and in time economists may be able to assist on the problems of resource allocation and utilization on a farm through the medium of function equations. Until that time, assistance can come from a less refined and more time-consuming method—synthesizing efficient farm units by budgeting the influence of alternative set-ups with physical relationships based upon standards of performance.

A short discussion of a project we have recently completed at Connecticut in cooperation with the University of New Hampshire and the Division of Farm Management and Costs of the BAE may help to visualize this method. The study is entitled, "Cost Reduction in Dairying," and the purposes were to establish ideals in resource organization and utilization within present technological limitations and given price relationships, to determine areas wherein cost reduction opportunities lay, to summarize existing standards of performance on crops and livestock and point up the gaps that exist in these data, and to indicate the usefulness of this approach in farm management. The theory associated with the determination of economies of scale was used as a vehicle to achieve these objectives. This was done because the scale technique is almost a discipline within the discipline of economics. Agricultural economists could immediately construct the conditions impinging upon the study. Furthermore, the technique neatly accomplishes the several objectives. As the scale curve is drawn tangent to firm curves representing the most efficient utilization of resources at different size, it is necessary to collect and integrate physical response data. Gaps in the existing information are indicated in this process. The technique also sorts opportunities for cost reduction into those associated with changes in the size of business and those associated with the organization and use of resources in the business.

Synthesizing the farm business is dependent upon input-output data for segments of the production process. I call these data standards of performance because they are over-simplified versions

of production functions. They represent superior but attainable levels of accomplishment under precisely defined situations when many of the usual variables are eliminated. In later application to individual farm planning, it is possible to show how the performance rates are altered by introducing some realistic variations into the situation. But in synthesis, we used the unadjusted standards such as alfalfa yields of 6000 pounds of hay per acre from a medium productive soil subjected to specified treatments, total milking time of five minutes per cow per day for a given man-equipment-barn combination. Once these standards have been obtained for a sufficient number of segments, synthesis of the average cost curves and scale curve is possible. Achieving the most efficient combination of resources and practices from the numerous alternatives is accomplished by budgeting to recognize marginal concepts and interrelationships of adjustments. Gradually the farm unit takes form around one definite item, such as size of the labor force, to give firm curves for the farms of different scale.

For the most part, performance standards were obtained from the studies of agronomists, dairy nutritionists, etc. Some standards, particularly those dealing with labor and equipment use, were developed by agricultural economists at New Hampshire and Connecticut. In developing these rates, physical input-output relationships were studied either on vanguard farms or on experimental farms. An approach to controlled conditions was achieved even under a farm environment by breaking jobs down to elements which could be precisely defined and which were subject to repetition. A description of physical inputs and outputs and the conditions under which they operate was secured. Comparisons between and upon farms were then made to determine the highest production efficiency for each necessary element in the job under any standardized condition one might select. A performance rate, arbitrarily set somewhat below this highest level, was then derived for the production phase with an indication of variability around this rate due to physical differences in such things as hauling distances, stoniness, barn layout, operating speed, load sizes, etc., that will vary between farms from the standardized situation.

More valid comparisons can be made between labor-equipment combinations through the use of these standards than by using the usual average data. By combining element requirements derived from the most efficient operators, an approach to experi-

mentally-controlled conditions can be achieved. For example, usual average data for haying equipment reflect differences in field conditions, labor capabilities, equipment conditions and management characteristics, as much as they do the basic differences between equipment. The construction of standard rates minimizes such unwanted influences by eliminating some of the physical differences, and by using a selected sample. A basic assumption is that there is less variation in management characteristics between the most efficient operators of groups using different kinds of haying equipment than there is between all operators in the groups.

In the Farm and Home Planning activity of Connecticut extension work, these standards have proved very helpful. In the step-by-step adjustments on his farm, the operator has been able to visualize what levels of accomplishment were reasonable under his situation. Average rates, on the other hand, have a nebulous character which does not permit meaningful application to an individual problem.

The usefulness of standard performance rates as a device to improve farming practices is demonstrated by the spread of the rapid milking method. After studying this problem, standards were established that were related to the performance of those dairymen who were using superior techniques. The goals and associated practice recommendations were then made available to other farmers. By applying these methods, milking time has been reduced on many farms even though, in this case, there was the problem of training the dairy cow as well as the dairymen. Another example shows how standard performance rates and associated techniques were used to improve hay-harvesting methods on an individual farm. After studying the problem and comparing his own operations with those which are recommended, the operator in this case was immediately able to reduce by 30 percent the time required to move one load of hay from the field into the mow. By making alterations in the barn and adding other installations, the time per load could have been reduced to 45 percent of the original requirements.

In summary, this presentation has emphasized that production functions are basic tools in farm management research. Although they can be applied at several levels, we believe that they are most helpful when used to express the interrelationship of input variables upon output in crop and livestock production. These data are necessary information when economic models are constructed to

assist the individual farmer by indicating possible directions of adjustment and the steps in achieving these objectives. Inadequacies in existing physical input-output relationships warrant the use of a less complex type of function which we have called standards of performance. These standards have been very valuable in farm planning to initiate individual adjustments.

Throughout this paper, emphasis has been upon the role which farm management plays in achieving adjustments on individual farms. We believe this is a necessary starting point before we can attack the broader problems of intra- and interregional competition, and of resource ownership and control. We believe that these problems along with the individual's management problems are met best by concepts of what could be rather than what is. Therefore this is the area and the methods we have chosen for our work in farm management research.

MEASURING THE MANAGEMENT FACTOR

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IN THE analysis of farm financial data it is a common practice to evaluate the level of management on the individual farm as a residual earning expressed as management earnings, operator's labor earnings, rate earned on the investment, etc. These factors are in a sense measures of management; but they are not entirely satisfactory for this purpose for perhaps three main reasons: (1) they are "after the fact" measures: they can be used only after the activity has been completed, and hence they have no prior predictive value; (2) they are not reliable as measures of management because they also reflect windfall profits and losses entirely apart from management. Likewise, they are not corrected, in the usual methods of calculation for earnings which result from varying degrees of exploitation of both human and physical resources; (3) and, finally, they measure a residual output rather than management as an input factor. It is quite conceivable that varying proportions of land, labor and capital associated with the same level of management will yield varying residual returns as measured by the factors mentioned.

So we are interested in finding a measure for the management factor per se, and such a measure as will admit, if possible, of predicting the level of management prior to the completion of the activity in question. Our problem then is a special segment of the more general problem of predicting human behavior.

Prediction research in human behavior concerns itself with two general problems: (1) finding a suitable criterion or measure of success in the activity, and (2) finding those situational and personal factors which are related to success, or are indices of factors which are related to success in the activity. Given the criterion and the predictive factors, appropriate statistical techniques can be applied to measure the degree of relationship and provide a quantitative basis for making predictions.

Predictions are usually based upon the degree of relationship between the criterion and one or more of three main types of predictive factors: (1) previous performance, (2) proficiency tests, and (3) personal characteristics. The first one requires that the individual be engaged in or have had previous experience in the activity.

Therefore it has limited value for vocational guidance to rural youths who have assumed no farm managerial responsibility. Proficiency tests measure previously acquired skills or knowledge, and therefore have limitations in the management field in addition to the difficulty of administering such tests. Personal characteristics admit a much broader interpretation of fitness for a given activity, but they present a more difficult problem of appraisal and quantification for prediction purposes. Nevertheless it is along this line that we are attempting to measure individual differences in farm managerial ability.

With these general methods and techniques in mind we are ready to approach the problem of measuring the management factor in farming, or predicting the level of success most likely to result from the personal and situational factors surrounding the individual farm operator.

One of the first problems is finding a suitable criterion of success in farming. In addition to the comments I have already made on the conventional measures of farm success, I must raise the question as to whether we can accept maximization of money income as the sole end and goal of farming. What about the non-material satisfactions in farm life, in effort directed toward the enrichment of community living, and in the use of leisure time in the pursuit of the cultural arts?

Wallace's Farmer, an Iowa farm magazine, conducted an opinion poll among Iowa farm people in the fall of 1947 on the question, "Who is a farm success?" The persons interviewed were asked this question: "Which of the following statements best describe your idea of the most successful farmer? Pick three statements marking them 1, 2, 3 in order of choice." The seven statements from which they were to choose were:

- "1. The one who gets the biggest yields per acre.
- "2. The one who follows the best soil conservation practices.
- "3. The one who is able to retire at the earliest age.
- "4. The one who gets the most income per dollar invested.
- "5. The one who has interests and satisfactions that do not depend on income.
- "6. The one who gives his children the best education.
- "7. The one who is the best leader in the community."

On the basis of first choices only, 43 percent of the men interviewed gave first choice to the best soil conservation, 16 percent to the most income per dollar invested, and 12 percent each to the big-

MEASURING THE MANAGEMENT FACTOR

gest yields per acre and the non-material income and satisfactions. The women agreed with the men on soil conservation with 38 percent of their first choices, but gave second place to the non-material satisfactions with 19 percent of their first choices. The biggest yields were third with 15 percent and the highest return per dollar invested fourth with 13 percent.

These were the results as published in *Wallace's Farmer*, November 1, 1947. However, using a weighted average (weights of 3, 2 and 1 for first, second and third choices respectively) for the men interviewees reduces soil conservation to 30 percent (still first place), raises most income per dollar to 18 percent (still second place), raises non-material satisfactions to undisputed third place, educating children to fourth place, and drops biggest yields to fifth place.

I quote this survey because the results are interesting, and because it illustrates some faults in a technique that has been used in studies on the management factor at Illinois and in other states. Aside from the statistical techniques employed in making the summary of such a survey, it must be recognized that the interpretation of the results must definitely be limited to the choices made available. For example, Iowa farmers may have felt that the one who has the best kept buildings and the neatest farmstead is the most successful, or the one who owns the most land, or farms the largest number of acres, or grows the tallest corn; but they had no opportunity to say so in this survey.

Furthermore, the degree of intercorrelation between items in the schedule gives rise to interpretations in the minds of the persons interviewed that cannot be treated statistically in the type of answers given. For example, some of these Iowa farmers actually made the statement that soil conservation was necessary to achieve and insure the goal of highest income, and hence they gave it first choice over income because they felt that the income would be a natural consequence.

Enough for the present on selecting a criterion of success. In our future work at Illinois it is my hope that we can introduce sufficient refinements into the measures calculated from our farm records that we may have a suitable criterion of the *financial* value of the varying inputs of management as distinct and separate from non-material satisfactions.

I have already implied that our present approach to the problem of measuring management lies in the use of personal characteristics

as predictive factors. The entire approach, at present, is an adaptation of the forced-choice rating technique developed and adopted by the U.S. Army in 1947 for its officer ratings. The technique was suggested to us by our cooperating psychologist, Dr. L. L. McQuitty, University of Illinois Department of Psychology, who commanded the army research section that worked on its development.

The new army rating is very clearly described by Dr. E. Donald Sisson, Assistant Chief of the Personnel Research Section of the Adjutant General's Office, in an article, "Forced Choice—The New Army Rating," appearing in the autumn 1948 issue of *Personnel Psychology*. Since I cannot improve by editing what he has written I shall quote directly and at some length from his article. For purposes of the present discussion I am substituting the word "farmer" for the word "officer" in Dr. Sisson's paper.

"Forced-choice rating elements are sets of four phrases or adjectives pertaining to job proficiency or personal qualifications. The rater indicates which of the four is most characteristic of the ratee, and which is least characteristic; and repeats this selection for each of the sets included. A sample set is the following:

- A. Commands respect by his actions.
- B. Coolheaded.
- C. Indifferent.
- D. Overbearing.

It is at once obvious that two of these are relatively favorable terms, and the other two relatively unfavorable. One of the two favorable terms, checked as most characteristic, gives plus credit; selecting the other gives no credit. In the same way, picking one of the two unfavorable items as least characteristic adds credit whereas the other adds nothing.

"The construction of these tetrads and the determination of the scoring key are the crucial problems in the development of a rating scale of this type. Rundquist outlined six steps in the process.

- "1. Collection of brief essay descriptions of successful and unsuccessful (farmers) officers.
- "2. Preparation of a complete list of descriptive phrases or adjectives culled from these essays, and the administration of this list to a representative group of (farmers) officers.
- "3. Determination of two indices for each descriptive phrase or adjective—a preference index and a discrimination index.
- "4. Selecting pairs of phrases or adjectives such that they appear of

equal value to the rater (preference index) but differ in their significance for success as an (farmer) officer (discrimination index).

"5. Assembling of pairs so selected into tetrads.

"6. Item selection against an external criterion and cross validation of the selected items."

In our current work at Illinois we have completed step No. 1 by securing essay descriptions on 360 good farmers and a like number of poor farmers. We have about completed the list of descriptive phrases mentioned in step No. 2, and are preparing to administer this list to a group of farmers this fall.

Turning again to Dr. Sisson's article I want to quote from his technical discussion on the construction of the forced-choice tetrads.

"As already noted, the scaling and selection of the rating elements to compose the forced-choice tetrads is the nub of the problem. The basic assumptions underlying the method can be stated as follows:

"1. Any real differences which exist between (farmers) officers in competence or efficiency can be described in terms of objective, observable items of behavior.

"2. These 'behavior items' differ in the extent to which people in general tend to use them in describing other people, i e., in general favorableness and this tendency can be determined statistically.

"3. These items also differ in the extent to which they characterize (farmers) officers at one extreme of the true scale of competence as opposed to (farmers) officers at the other extreme. The index of this difference, the 'discriminative' value, can also be determined statistically.

"4. Pairs of items can be selected such that they are equal in preference value but different in discriminative value. A rater forced to say which item is most (or least) characteristic of a ratee is thus unable to select solely on the basis of prejudice for or against him (since the preference values are equal). The rater is compelled to consider both alternatives and—theoretically at least—to do a more objective job of reporting."

With these assumptions and the outline of the steps in mind, our first task was to develop a questionnaire that would yield the descriptions we needed and such additional data as we thought necessary. Since it was impossible to assemble in one place a large enough group of farm people willing to cooperate on this study, it became necessary for the questionnaire to carry complete instructions so that data gathered from several different groups would be comparable.

Our language had to be carefully chosen to convey the intended meaning—the same meaning to all—and avoid being suggestive in any way. The opening statements were intended to stimulate interest and provide some incentive for active cooperation. Then followed a few statements asking for careful and independent work. Participants were assured of complete anonymity to remove any reticence at full and free expression. The papers were not signed or identified by the participants.

The task was divided into twelve steps to be taken one at a time and completed in order. The first step asked our participants merely to “consider some Illinois farm operators who do a poorer-than-average job of farming.” One-half of the questionnaires, in alternate fashion, began with the poorer-than-average farmers while the other half began with the better-than-average farmers. Thus we secured about one-half of our descriptions on each kind of farmer before our participants began to show noticeable fatigue. It was a wise precaution since the questionnaires took from 45 minutes to an hour to complete.

The second step asked the participant to “think of three of these farm operators (better or poorer-than-average) whom you know well enough to describe most completely and accurately.” Here the emphasis was placed upon how well our cooperators were acquainted with the people they were to describe. This step avoided the selection of those few individuals in every community who have earned reputations as good or poor farmers, but who are not well enough known by most people to get an accurate description. They were asked not to select relatives in order to avoid personal bias.

In the third step the participant was asked to “*pick the one from these three* who, in your opinion, does the poorest (or the best) job of farming.” This step was included to give us the desired range in performance from good to poor among farmers well known to the same person. This step also avoided setting up any criterion by deliberately urging the describer to “use your own ideas of poorest and poorer-than-average” (or best and better-than-average).

The fourth step asked for a series of objective data on the farmer selected in step No. 3. Included in this list were age, years in school, total land farmed, acres of this land owned, type of farming, character of the land, and the county in which the farm was located. If the describers raised questions about their ability to answer these questions they were advised to go back to step No. 3 and select a man with whom they were better acquainted.

The fifth step was really the crucial step. Here it was necessary to convey the idea of a complete description without being suggestive or introducing bias in any way. Remember that our participants were completely ignorant of the objective of the study or the purpose for which this information was being gathered. We had to avoid using such words as "behavior" and "personality" because they are not in familiar usage by farmers and would not be interpreted alike by all. So we agreed on the following simple but straightforward statements "We want you to write a description of *this man*. Tell us everything you know about him as a *man* and as a *farmer*. Please take your time and think. He may have both good and bad characteristics; describe them both. The important thing is that you describe him as completely and accurately as possible."

Steps 6 through 10 were an exact repetition of steps 1 through 5 except that where one called for a poorer-than-average farmer, the other called for a better-than-average farmer. Steps 11 and 12 were opportunities to enlarge upon the first descriptions through the aid of a list of items intended to remind them of statements which they failed to make in their original descriptions. These reminders were not handed out until the original descriptions had been handed in.

Of the 360 questionnaires filled out 18 were written by high school vocational agriculture teachers, 44 by Soil Conservation Service Work-Unit Conservationists, 13 by fieldmen in the Farm Bureau Farm Management Service, 43 by professional farm managers, 81 by freshmen and sophomore students in the College of Agriculture, and 161 by farmers cooperating in the Farm Bureau Farm Management Service. Thus all of the descriptions were obtained from people living on farms or working more or less intimately with farmers.

Whatever doubts I may have had about the ability of our farmers to become articulate with a pencil certainly disappeared when I read their essay descriptions. Among some of the rather original and poetic expressions they used in describing the poor farmers were these:

"Always fixing when he should be farming."

"More or less works around the edge of a job."

"A non-farm-management farmer."

"Hurries everything he does but getting home from town."

And the one that has particularly impressed me with its literary

style and its aptness: "Neither whiskers, nor weeds, nor uncastrated pigs annoy him."

The 360 questionnaires, or 720 descriptions of individual farmers yielded approximately 7,500 descriptive statements, phrases or adjectives. Each of these was put on an individual punch card together with all the data associated with it such as the age of the farmer to which it applied, his education, size of farm, tenure, type-of-farming, etc. Thus we have an enormous amount of data for analysis pertinent to the present problem.

Our first job was to classify each of 7,500 descriptive items and make a list of one representative item for each classification. Since this step involves a good deal of subjective judgment we decided that the job was to be done independently by three different people with a final meeting to reconcile the differences. Dr. McQuitty and I have completed our classification at this writing, and Dr. D. M. Hall, Extension Service, University of Illinois, is working on the cards at the present time. In my own classification I recognized some 328 different items applying either to job proficiency or personal characteristics.

The embodiment in one individual of functions comparable to business manager, foreman, and laborer produces a complex problem which is further complicated by the self-employed, rather independent situation of the average farmer. I anticipate that we shall encounter difficulties in scaling which may result from the fact that the population of farmers includes a wide range of personalities and attitude types that may produce a mixture of scale values for similar character traits or descriptive items. There is a possibility of a number of rather independent types among the poor farmers which may require a considerable degree of stratification on both personal and situational factors to get satisfactory scale values.

The tenure situation will require special treatment to correct for the influence of the landlord who may contribute a great deal to the apparent success of a tenant farmer, or who may actually prevent the tenant from using his best managerial ability. Still other problems confront us, such as obvious inequalities of opportunity and the matter of being "born at the wrong time", that greatly influence the degree of success in an economic venture over and above the entrepreneur's personal contribution. At this writing we have no final answers. We do have hope, the will to work, and some interesting hypotheses.

MULTIVARIATE ANALYSIS OF FARM AND RANCH MANAGEMENT DATA

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IN GETTING at this subject, perhaps I should define what I think was meant by "multivariate relationships." This might be described as a relationship wherein the behavior of one characteristic or variable (the dependent variable) is influenced by the behavior of two or more characteristics or variables (the independent variables). The problem of multivariate analysis is generally accepted as being that of identifying, isolating, and measuring the influence that each independent factor exerts on the dependent factor.

There are several conditions generally inherent in farm and ranch management data that tend to make this problem very complex. In the first place, there usually are many independent factors to be identified; secondly, in nearly all cases the influence is not linear, but responds to the law of diminishing returns within the range of a given study; third, most of the distributions are not normal but are skewed to the right. (There are several methods available for converting a skewed distribution into a normal one—but they are rather complicated and require a great deal of time.) The relationships are not additive, but are joint—that is—the influence of one independent factor on the dependent factor is not determined entirely by the size of that one independent factor alone, but is influenced by the size of another independent factor. There is also a problem of causal relationships—when a change in the magnitude of one independent variable is the direct result of a change in the magnitude of another independent variable.

My procedure, in starting on this assignment, was to review the vast amount of literature on the subject. This problem certainly is not new. The next step was to compare these several methods through the details of analysis of a given set of farm management data. Some sixty farm records taken in 1947 were used in comparing these methods. Determining the factors affecting profits was selected as the problem, as it is one that has long since been explored by Dr. Warren and others, and whose conclusions have been proven time and time again. I have selected this problem because it adapts itself so well to multivariate analysis.

It will be impossible in this brief discussion to outline the methods, or to substantiate conclusions with a detail of figures. I will merely discuss the relative merits and weaknesses of the several methods available for making a multivariate analysis of farm management data as I found them to be.

Tabular Analysis, or cross tabulation, is the simplest method available, as it is based solely upon the arithmetic average. From the standpoint of time and clerical help it is the most efficient. As the data in each subgroup are used in determining the averages of that subgroup only, and exert no influence beyond that subgroup, this method makes most inefficient use of data. For example, if there are four independent variables to be studied, and if the data are broken into three groups for each variable, it would necessitate 972 farm records to give 12 observations for each subgroup if the farms were all equally divided among the subgroups, which, as you know, would seldom happen. For most of us, this number is prohibitive.

The method offers no measurement as to how closely the factors being studied are correlated. The reliability of tabular analysis may be tested by the "t" ratio test and the analysis of variance technique for significant differences between the subgroup averages.

One of the errors of tabular analysis of multivariate relationships arose from the erroneous assumption that to subdivide farms on the basis of magnitude of size, and yield, eliminated, in turn, the effect of the one factor on the other. This was not true. There was considerably greater variation in size of farms on those whose yields were below average than on those whose yields were above average. Neither was the crop index the same for the different sized groups. This is an interserial influence that tabular analysis fails to consider. Aside from this interserial or causal influence, joint relationships can be isolated using tabular analysis. Because of its inefficient use of data, the nature of the curvilinearity of a relationship cannot be accurately determined, because the data cannot be broken into a sufficiently large number of subgroups to establish curvilinearity.

Mathematical Correlation is the technique of describing a line that most nearly fits the data being studied. The most universally used mathematical device for fitting a line is the method of least squares, which describes a line from which the deviations, when squared, will be smaller than any other line. The advantages of mathematical correlation are: (1) it makes more efficient use of

data than the other methods, (2) it measures the degree of correlation between the factors being studied, and (3) measures of reliability, and the standard error of estimate, can be computed from the calculations required for the regression equation.✓

The disadvantages of the method are: (1) it is difficult and tedious to work. For example, with just four independent factors, two pairs of which are joint, assuming the simplest form of curvilinearity, it would take 66 different series of computations as the basic data from which the normal equations could be solved; (2) the biggest weakness of this method is that the selection of the formula determines the general nature of the line—i.e., a linear equation is capable of describing only a straight line, even though the relationship may actually be curvilinear. There are many curvilinear formulas possible, from which the analyst must choose one that will best describe the relationship to be studied. Thus he pre-determines his answer a great deal by his selection of a formula. With a joint relationship this procedure is complicated further by the number of possible ways of describing the joint relationship. It may be expressed as $X_1 = b_2X_2 + b_3X_3 + b_{23}X_2X_3$, which is perhaps the simplest expression. The relationship might also be

$$\frac{X_2}{X_3}, \quad \frac{X_2}{X_3}, \quad \frac{X_2}{\log X_3}, \quad \frac{1}{X_2X_3}, \quad \frac{X_2 + X_3}{\log X_2X_3}$$

and many other more complicated forms.

Before leaving the mathematical correlation methods, mention should be made of the *Court* method for analyzing joint relationships, published in 1930. This method depends upon a mathematical rotation of the surface of cubes so that instead of averaging the values only when viewed with respect to the rectangular axes, they may also be averaged with respect to axes cutting across the surface at an angle. This method is worthy of investigation and study by the farm management analyst.

Graphic Correlation analysis is of several types. There is what I will call the formal method, which has as its starting point the mathematical linear multiple correlation, and makes a series of corrections to these lines by plotting the residuals or deviations until no further corrections appear warranted. Another method, the short-cut or *Bean* method, was developed by Louis Bean. This method assumes the general nature of the relationship by plotting a few selected observations, and then makes a series of corrections

on the assumption by plotting the residuals. This method took less than one-fourth the time required for the formal method.

These two graphic methods have much the same advantage as the mathematical correlation. They are less precise, however, and must be used with caution. If the number of cases are extremely large, they tend to lose some of their advantage of saving time and clerical labor. They do have an advantage in that they do not assume to know the nature of the relationship at the outset.

Determining joint relationship by contours. A method has been worked out by Frederick V. Waugh and others by which a three-variable surface may be smoothed directly in both independent dimensions at one time by the use of isorropic lines. With this method the nature of the relationship is not assumed at the outset, but unfolds as the work progresses. The first step is to plot the observations on a graph, with one independent variable as the abscissa, and the other independent variable as the ordinate. Thus, the location of each observation on the chart is determined solely by the size of these two independent variables. The value of the dependent variable is written on the graph beside the point where the observation falls. The joint relationship becomes evident upon inspection by comparing the location of the points whose values are approximately equal. To assist in the measurement of this joint relationship, contour lines are drawn in by inspection to most nearly represent the scale of values for the dependent value. This, of course, can be only an approximation. The deviations of the actual from the estimated, can be obtained by interpolation. It is obvious that the standard error of estimate, and the index of correlation can be only an approximation.

This method does have merit in that it is highly flexible, and saves time. It is limited to two independent variables at one time, however.

The problem of causal relationships between the independent variables. When a change in the magnitude of one independent variable is the direct result of a change in the magnitude of another independent variable, they are said to have a causal relationship. If one of the two causal factors is held constant at its average while the other factor is varied, a condition has been created mathematically which will not be likely to happen in actual practice. For example, it was desired to determine the net effect on income of feeding livestock, after the effects of size, crop yields, and labor

efficiency were eliminated by being held constant. Two arguments for feeding livestock are that it will increase crop yields and labor efficiency. Thus, to hold these two factors constant at their average while studying the effects of feeding livestock, eliminates some of the advantages of feeding livestock. It is impossible to isolate the net effect of livestock feeding on income by any of the methods mentioned thus far. However, the mathematical regression equation, *when taken as a whole*, and the multiple correlation coefficient, give the correct combined effect of the several factors studied.

With tabular analysis, a causal relationship introduced an error that was not detected when only the average labor income for each group was presented. The error was due to variation in the average values of the independent variable, when the assumption was made that they were the same. Thus, the influence of a factor was not eliminated by subgrouping, because of an interserial or causal relationship, which also contributed to unequal numbered subgroups.

In summing up my investigation of the question of causal relationships between independent variables, it must be pointed out that when a causal relationship exists between two independent factors, the net effect of one of the independent factors on the dependent factor cannot be determined. The true combined effect can be determined using multiple joint correlation, provided the correct mathematical formula is selected.

It might be well to review the *purpose* of our investigation in farm management. If the purpose is to determine the most favorable combination of highly inter-related factors, should we concern ourselves with trying to isolate and measure net effects of each factor? From the multiple joint correlation regression equation the most favorable combination of factors can be arrived at mathematically by use of the integral and differential calculus.

As might be expected, there is no one solution to the problem of which statistical method to select for multivariate analysis of farm management data. Quantity of data is one of the determining factors considered in the selection of the method to be used. Because of the paucity of data available in most farm management research, cross tabulation is of doubtful reliability for the final analysis. Mathematical correlation is too inflexible for use in the original investigation procedure. Tabular analysis, and the graphic methods should be used to explore the many possible related factors

in any management study. Those factors that appear to exert the greatest influence can be defined further and tested by the mathematical correlation methods and calculus.

My very limited investigation leads me to say that our science does not stand in need of statisticians, as such. What it really needs is farm management analysts, equipped with economic theory as a tool, and trained also in statistics. Edgar Allen Poe stated this more keenly: "To observe attentively is to remember distinctly; . . . While the rules of Hoyle (themselves based upon the mere mechanism of the game) are sufficiently and generally comprehensible. Thus to have a retentive memory, and to proceed by 'the book,' are points commonly regarded as the sum total of good playing. But it is in matters beyond the limits of mere rule that the skill of the analyst is evinced. He makes, in silence, a host of observations and inferences. . . The necessary knowledge is that of *what* to observe."¹

DISCUSSION

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These three excellent papers discuss several new approaches and techniques in farm management research. Mr. Fellows' paper on developing and applying production functions in farm management research places this technique in proper perspective. All of us are interested in increasing our knowledge of how to establish relationships between variables so prediction can be made with greater certainty. The use of mathematically derived production functions will be extremely helpful, but as Fellows points out we do not have the data available in many areas, particularly in physical input-output relationships, to derive the kind of production function that would be most useful.

Fellows rightly points out some of the weaknesses of institutional segmentation of research. This is an old problem, but progress is being made. A particularly hopeful sign is the great interest in developing balanced farming and similar programs. These programs emphasize the farm management approach—the necessity of treating the farm as a unit and obtaining coordination and integration—not only in the farm plan and operations, but also among the various specialists giving advice to farmers. These developments, however, will challenge farm management workers still further to supply the necessary economic evaluation and interpretation.

The development of standard performance rates seems to be a very useful device. Farm management workers can be in the vanguard in pointing

¹ Edgar Allen Poe, "The Murders in the Rue Morgue," *Representative Selections* by Alterton and Craig, American Book Company, New York, 1935.

out to farmers the possibilities in adoption of new technologies—rather than reporting what has happened after their adoption generally by farmers.

Mr Reiss' paper deals with an intriguing, although difficult subject of research. It is indeed gratifying to have some one tackling this difficult problem with some new and fresh ideas. The Division of Farm Management and Costs is much interested in this work, in fact to the extent of helping initiate and finance the project.

We have felt that in order to make progress beyond that attained heretofore and to take advantage of some wartime developments, a marriage was necessary between farm management and psychology. This is essentially an experimental study. Whether it is possible to identify personal characteristics in farmers or prospective farmers that will have predictive value in measuring success or managerial ability in farming is certainly open to question. But here is a new approach that offers some possibilities.

Hopkin has given an interesting appraisal of the merits and weaknesses of available methods of making multivariate analysis of farm management data. Occasionally we need to take stock of our bundle of tools and reappraise their usefulness, if for nothing more than to refresh our memories a bit. We need to give careful thought to which statistical technique is best under particular circumstances and objectives. Too many of us give too little thought in planning of projects to the most appropriate kind of statistical analysis.

Emphasis on development of hypotheses and careful attention to project design, including the development of the most appropriate statistical technique for the particular objectives—all this prior to the taking of field schedules—is certainly an essential if we are to make most effective use of limited research budgets and make the progress in research results that is expected of us.

We can go in several directions in planning our research. First, with relatively fixed budgets we can limit the number of studies made so that each will include enough cases for valid statistical treatment.

Or second, we can quit trying to make all-purpose general farm management surveys that try to cover all conceivable situations in a farming area. This means limiting the scope of studies to a few of the more important situations or variables. For instance, we can limit our sample to 80-acre dairy farms of a particular soil type, rather than attempting to cover several different sizes and soil types.

Or third, we can give more emphasis to case analysis. This has some weaknesses for some purposes, but may have far more value in the end than attempting broad-scale statistical analysis with inadequate data.

I believe we have made some progress in use of better statistical and research techniques in recent years, particularly in the direction of more precise delineation of the problems to be studied, in more careful determination and limitation of the universe to be covered in terms of the important variables, and in more careful sample design and sample selection.

These are problems, however, that need careful consideration in all of our research, and I'm sure that much more progress is possible than has been attained so far.

NEEDED NEW DIRECTIONS IN AGRICULTURAL PRICE ANALYSIS

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THIS paper is addressed to persons who, like myself, are primarily interested in answering specific questions about agricultural prices. I should like to separate the applied science of agricultural price analysis rather sharply from the related pure sciences of economic and statistical theory. When I speak of needed new directions I am thinking of ways in which the level of applied work may be improved and the results made more useful for purposes of prediction or policy formation.

Regardless of the state of pure theory, decisions must be made and action taken. Price support legislation, storage policy, marketing agreements and cooperative marketing programs all raise questions which involve supply and demand curves. In the absence of measurement, such questions may be answered only by hunch and assertion. Arguments over the merits of flexible price supports are partly based upon different assumptions regarding farmers' response to price. The relative merits of price support purchases and compensatory payments for different commodities depend partly upon the shapes of their demand curves. The desirability of using compensatory payments on hogs depends partly upon the closeness of competition between hogs and beef cattle. Wherever measurement of the key relationships is possible, there is a chance to improve the quality of administrative or legislative decisions.

The usefulness of such measurements will depend very largely upon the adequacy of the economic and institutional analysis underlying them and upon the appropriateness of the statistical techniques used. However, I feel very strongly that improvement in the present level of applied work does not need to wait upon *new* developments in theory or methodology. I think we can still make some advances in agricultural price-supply-demand analysis with no more elaborate theoretical tools than were available to Ezekiel, Schultz, and others almost twenty years ago. Additional insight can be obtained with the aid of economic and statistical concepts developed or popularized during the last two decades.

Successful price analysis requires a fusion of statistical technique, economic theory and specific knowledge of commodities and

markets. This is a big order for one person. Few commodity specialists have made the necessary investment in theory and technique. On the other hand, a predilection for theory is often associated with a distaste for empirical research. The striking thing about the development of price analysis in the 1920's is that it was spear-headed by men who were primarily agricultural economists, and who reached out into economic and statistical theory for the purpose of improving their applied work. However, this tradition has been greatly attenuated by sixteen years of farm programs, war and reconversion during which these men and their immediate followers moved out of price analysis or at least into positions where they had little time or incentive to publish in that field. On the basis of published work, it would be hard to identify any successors of Ezekiel, Bean, Waite, and Working who have achieved a more effective synthesis than they did of the skills and interests needed for commodity price analysis.

In my opinion, the most immediate need of agricultural price analysis is that young men with advanced training in theory and statistics be brought into contact with the practical problems of the field. In view of the increasing specialization of economic theorists, mathematical statisticians and commodity analysts, it may actually require teams of specialists under competent and imaginative supervision to fill this need.

Given the basic combination of skills and interests, there are good reasons for believing that we can improve upon the analyses of the late 1920's and early 1930's. (1) In the first place, we have longer statistical series. Whereas many of the price analyses made in the 1920's were based on pre-1914 data, we now have for most commodities about 20 years of usable data from the interwar period—roughly, 1921 to 1941. (2) Improvements have been made in our basic estimates of production, prices, and stocks, and new series on total and per capita consumption have been developed. Thus, more economic concepts now have their statistical counterparts, and errors of measurement in many of the basic series have been reduced. (3) In particular, we now have estimates of national income and related variables which are much better measures of demand for farm products than the makeshifts (such as industrial production, pig iron production or stock prices) which were sometimes used in the early 1920's.

In using these improved materials, we can avoid one of the dead

ends encountered in the early and middle 1920's, the correlation of only distantly related variables with the immediate object of obtaining a high correlation coefficient. As a rule, relationships of this sort proved highly unstable. The mere fact that such analyses did not "make sense" in terms of economic theory tended to reflect discredit upon the whole field of quantitative price research.

Really fruitful lines of development must be based upon concepts of causation or at least structural relationship. This view was strongly advocated by Sewall Wright and E. J. Working in the 1920's and early 1930's. It lies at the basis of Ragnar Frisch's method of confluence analysis and of the Cowles Commission technique. In 1934, E. J. Working stressed "the need for analysis of demand in terms of causation" . . . It is only when we combine statistical evidence in a closely knit reasoning process that we can hope to arrive at causal and hence permanent relationships between factors." This passage was quoted with approval by Tjalling Koopmans in 1937. Subsequently, Mr. Koopmans has played an active part in developing the Cowles Commission technique, which aims at the measurement of structural relationships between economic variables.

The philosophically minded may boggle at such words as causation. If our economy were really a static universe, we might satisfy ourselves with statements about the probability that a given value of pig iron production would be associated with a Chicago corn price lying within a specified interval. In actuality, the danger of spurious correlation between time series due to trends and major cycles is so great that we can hardly hope to obtain stable relationships unless we succeed in approximating rather simple and direct lines of influence which reflect the behavior of identifiable economic agents.

This approach places a great deal of emphasis upon the preliminary analysis of a problem. On a formal level it may involve the construction and simultaneous statistical fitting of complete "models." A less ambitious but highly instructive procedure is simply to draw a diagram of the various factors which seem, on the basis of observation and theory, to be involved in the problem. Starting with a central square representing (say) the U. S. average farm price of a commodity, bring in the various elements which play upon it most directly, such as farm production and stocks and dealer and processor demand. The demand of processors, for ex-

ample, is influenced by anticipations of demand from wholesalers, retailers and ultimately from final consumers. The quantity demanded by consumers is influenced by the retail price of the given commodity and to a lesser extent by those of competing commodities; also, by consumer income and other factors. As a matter of logic, such a diagram can be elaborated into a complete system of Walrasian (or Hicksian) equations. But this is merely the *reductio ad absurdum* of a useful tool.

Such a diagram, extended to not more than twenty or thirty "boxes" or variables, will lead to the conscious consideration of a good many problems which might otherwise be glossed over. What minimum time unit is necessary, in the case of a particular commodity, to average out the effect of anticipations upon the relationship between farm and retail prices? What is the maximum time interval within which current production or supply is not significantly affected by current price? Is it permissible to express farm price directly as a function of consumer income, or is it necessary to measure separately the relation of retail price to consumer income and the relation of farm price to retail price? Is it reasonable to use the index of wholesale prices of all commodities as a deflator or demand shifter in explaining the farm price of potatoes? A diagram may indicate that various components of this index enter into the explanation in such different ways that no confidence can be placed in the net regression of potato prices upon the over-all index. It may also lead to a realistic appraisal of the degree of error introduced by aggregating or ignoring certain variables, and by measuring certain coefficients or characteristics of a model independently of others.

I do not think that successful application of a causal or structural approach requires the simultaneous determination of every net relationship in such a diagram. The Cowles Commission has, indeed, worked out a technique whereby a complete model, defined in terms of five or more equations and fifteen or more "structural coefficients," can be fitted simultaneously. However, as the complexity of such models increases so does the likelihood of introducing some weak or unstable elements into the structure. Each structural coefficient represents an average relationship over the whole time period for which the model is fitted. Unless the underlying relationship has in fact been fairly stable over this period, that particular coefficient will be misleading and it may also lead

to distorted values for the other coefficients. A model which assumes the stability of each of a large number of net relationships over a twenty-year period may well imply a greater degree of economic determinacy than has actually existed. The Cowles Commission has opened up what may prove to be a very fruitful type of analysis. Its discussions of the "identification problem" and the biases which arise when the least squares method is used inappropriately have been useful byproducts. However, the published applications of the Cowles Commission technique to date have been mainly illustrative, and considerable further testing and development is needed before its place in substantive research can be defined. In the meantime, the pursuit of structural or causal relationships must be carried on largely by other means.

One line of attack is the cross-checking and comparison of logically related analyses. Most commodity price analysts in the past have looked at one product at a time. Yet it seems quite obvious that an analysis of the demand for all meat should be checked against similar analyses for beef, pork, lamb, and veal, taken separately. Analyses of retail meat prices should be checked against analyses of farm prices or Chicago prices of meat animals. Analyses of farm prices and farm cash receipts from meat animals should check out against analyses of cash receipts from all livestock products as a group. An estimated elasticity of demand for all food at retail may have to be reconciled with the estimated flexibility of U. S. farm prices with respect to the physical volume of farm marketings. Time series results should make sense in relation to family budget data or the results of consumer preference studies.

In a word, I believe that our knowledge, or hypotheses, about factors affecting farm prices will have to be based primarily upon the agreement or disagreement of many semi-independent pieces of evidence. I do not know what sort of probability statements we shall be able to make as the result of our cross-checks and comparisons. It may be useful in some cases to combine a number of separate equations into a more complicated model which can be fitted by the Cowles Commission technique. In other cases it may be legitimate to pool information from two or more equations by other mathematical processes. However, in the present state of the art, we cannot avoid nonstatistical judgments when we try to allow for recent changes in the structure of forces playing upon a

commodity. Only Laplace's "divine mathematician" could hope to fit all elements of the agricultural price system into an unambiguous set of prediction equations.

So far in this paper I have tried to make the following points. (1) We need to establish, either in individuals or in teams of specialists, the sort of combination of theoretical and factual knowledge to which the leading analysts of the 1920's at least aspired; (2) we should concentrate on a search for causal or structural relationships which "make sense" in terms of economic theory and institutional factors and which are therefore likely to be fairly stable over the time interval with which we are concerned; (3) the search for structural relationships can be aided by careful qualitative analysis of the lines and directions of relationship between variables, and perhaps by the construction of mathematical models; (4) aside from careful qualitative analysis, our main safeguard against false conclusions from individual price analyses will lie in the reconciliation of semi-independent analyses for other commodities, aggregates, or market levels. By and large, these suggestions amount to a revival and amplification of the "traditional" approach to price analysis developed in the 1920's, with progress depending in part upon the existence of longer and better statistical series than were available at that time.

However, there have been a number of developments in economic and statistical theory during the past two decades which may further enrich our applied work. One of these is the concept of indifference curves which was reintroduced into the British and American literature by Hicks and Allen during the 1930's. Even though it may not be possible to measure indifference curves empirically, I think that the concept is helpful in visualizing the relationships between competing and independent commodities and the differing effects of changes in relative prices, in incomes, and in tastes.

Theories of imperfect competition with their emphasis on product differentiation may improve our applied work by helping us to avoid sweeping generalizations about "average prices" which are not justified by the structure of the markets in question or by the substitutability of the different grades and varieties which figure in the average. The concept of cross elasticities of demand which grows out of the theory of imperfect competition may be useful

in determining the relative homogeneity of commodity groups and the permissibility of aggregating the prices or quantities of different commodities into a single composite variable.

In the field of statistical technique, Ragnar Frisch's method of confluence analysis, developed during the 1930's, should be singled out for experimentation and testing in applied work. Efficient application of Frisch's technique requires that regression coefficients be calculated by a matrix method with which few agricultural economists in this country are familiar, even though an appropriate computation scheme was published by Fred Waugh more than ten years ago. Frisch's method stems from the basic fact that when two variables are not perfectly correlated, two different regression equations are obtained by minimizing the squared deviations for each variable in turn. The structural relationship (if any) between the two variables presumably lies somewhere between the two elementary regression lines. Confluence analysis provides a routinized method of determining the consistency of correlation results when deviations are minimized along different axes and also of determining the effect of additional variables upon the net regression coefficients. Frisch's method was extensively used by Tinbergen in the statistical testing of business cycle theories (1939), and has more recently been used by the British economists Richard Stone (1945) and A. R. Prest (1949) in the field of price and consumption analysis. It is possible that the mechanical safeguards offered by this method will cause some investigators to slight the basic qualitative analysis of their problems. Nevertheless, it is a tool which deserves serious trial in this country.

One area in which radically new methods may be needed is the analysis of short-run changes in prices of perishable commodities. This area is of particular concern in the operation of marketing agreements which provide for volume and quality controls. For example, the level and slope of the demand curve in Week Number 4 may depend upon the volume and quality of shipments in Weeks 1, 2, and 3. Due to inertia if nothing else, the position of the demand curve in Weeks 5 and 6 might be affected by the position in Week 4. Thus the problem of maximizing returns over the marketing season as a whole involves the controlled distribution of the commodity between *interdependent* markets.¹

¹ This problem was brought to my attention by George Mehren of the University of California.

Care must be taken here to distinguish between shifts in the demand curves of final consumers and shifts in the demand curves of dealers based on short-run anticipations. It seems likely that anticipations will play a prominent part in farm price changes during any period which is short in relation to the normal transit-and-storage life of the commodity. The traditional methods of season-average-price analysis are probably inadequate to explain such short-term price variations. Special case studies may be necessary to disclose the rational and irrational factors that enter into the anticipations of representative dealers. Study of highly perishable commodities may also throw light on the more general problem of determining the minimum interval of time which is logically and/or statistically necessary to reduce the interdependence of successive price observations below some predetermined level.

Time does not permit the consideration of several technical problems on which new research is needed, such as aggregation, statistical deflation, and choice of functional forms. Among other things, the choice of appropriate variables to represent consumer demand has not yet been definitively treated. I should like, however, to raise one extremely practical question which faces us at the present time: How shall we adapt analyses for the interwar period 1920-41 to the requirements of prediction and control during the years immediately ahead? The trebling of national income and near doubling of the wholesale price level since the 1930's have raised the problem of extrapolation in an acute form. The requirements of extrapolation may force us to use logarithmic rather than arithmetic equations for the interwar period in many cases, and in others to use deflated rather than actual prices. Analyses based upon year-to-year changes (for example, logarithms of link relatives) may be more useful in many cases than extrapolating analyses based upon the original variables. The recent studies of Cochrane and Orcutt indicate that the first step, and in many cases the only necessary adjustment, in analyzing relationships among serially correlated time series is to transform each series to first differences. Of course, the year-to-year change method breaks down when demand shifts rapidly, as it apparently did in the case of meat and dairy products during 1948-49.

One other possibility is that the methods of sequential analysis can be adapted to choosing between alternative models in a minimum amount of time. Certainly, each new year of the postwar period furnishes us with additional information on the structure of

postwar demand. I am hopeful that we can obtain much more accurate forecasts by the pooling of prewar and postwar information than would be implied by the standard errors of forecasts from the prewar analyses themselves. It should give us some encouragement to consider that a similar problem of extrapolation also existed in the 1920's, a period during which great progress was made in price analysis.

STATISTICAL ISSUES IN PRICE RESEARCH

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AS MR. FOX has suggested, there is great diversity among the procedures currently used or advocated in the analysis of demand. The diversity exists even though all the workers may concur in thinking of the nature of our economic system on the lines of the Walrasian model, consisting of a very large number of simultaneous equations connecting all economic variables.

The diversity of procedures appears as soon as the workers try to use their common model for prediction. Unfortunately, the model is only vaguely specified, and is extremely complex. Anyone who wants to use it in clarifying social problems must accept the necessity for simplification. Wherever there is simplification, there are sources of error in prediction. Each worker will choose his own simplification, attempting to avoid the errors that he thinks can be easily avoided, and those that he thinks have serious effects on the appropriateness of social action.

Under such conditions, it is not to be expected that there will be any one procedure that ought to be considered the correct one. At least for the present, there seems to be little hope of avoiding a resort to opinion. As price research continues, there may be a consensus among workers to the effect that a certain type of error can be handled conveniently by adopting a specified technique; in such a case, the refinement can be expected to become part of the working knowledge of most researchers. In another case, there may be no feasible way of determining the relative seriousness of a group of errors; in such a case, workers may have to rely on intuition, or on a comparison of computation difficulties.

The uncertainty that surrounds our work can be seen by considering the relation between "shock" and "error" models. Assume that one of the equations of a complete economic model is the following:

$$(1) \quad \alpha p + \beta q + \gamma I + \epsilon_1 x_1 + \cdots + \epsilon_n x_n = 0,$$

where

p is the price of a good,

q is the quantity bought in a specified period,

I is the national income for the specified period,
 $x_1 \cdots x_n$ are other variables influencing the relation between
 price and quantity, and
 $\alpha, \beta, \gamma, \epsilon_1 \cdots \epsilon_n$ are unknown parameters.

The variables $x_1 \cdots x_n$ have, individually, slight effects on price and quantity. However, taken as a group they exert a significant influence on the market results.

Assume that we are unable to observe $x_1 \cdots x_n$. Assume also that we are unable to observe I directly; instead, we observe an $I^* \cdots$ a composite of I and other variables, $y_1 \cdots y_m$. Concretely, let

$$(2) \quad I^* = I + \eta_1 y_1 + \cdots + \eta_m y_m$$

where $\eta_1 \cdots \eta_m$ are unknown constants.

Suppose that we fit some function to the variables p, q, I^* . We shall have

$$(3) \quad \alpha^* p + \beta^* q + \gamma^* I^* = 0$$

where $\alpha^*, \beta^*, \gamma^*$ are the fitted constants. This expression is equivalent to

$$(4) \quad \alpha^* p + \beta^* q + \gamma^* (I + \eta_1 y_1 + \cdots + \eta_m y_m) = 0.$$

Plainly, α, β, γ and $\alpha^*, \beta^*, \gamma^*$ are different sets of numbers. They differ because (4) includes a spurious "y" influence, and because it also excludes a legitimate "x" influence. The inclusion of the "y's" represent "error." The exclusion of the "x's" represents "shock."

Presumably we can improve on $\alpha^*, \beta^*, \gamma^*$, if we take into account both types of shortcomings in our model. However, no way of doing so is available at the present time. There are ways of dealing with either "error" or "shock" separately. In choosing to use either an error model or a shock model, the worker must make up his mind about the relative seriousness of the two differences between (1) and (4). For instance, he must decide about the seriousness of imperfect reporting of statistics (error) in relation to the seriousness of the omission of a large number of variables whose individual effects on the market are slight (shock). Presumably there is no reason why all workers should reach the same conclusion on such an issue. For instance, a large part of the research that has been done at the Institute for Applied Economics, Cambridge Uni-

versity, has assumed an error model.¹ On the other hand, most of the work identified with the Cowles Commission has assumed a shock model.²

Issues

Simultaneity: It seems to be necessary to deal with at least one demand curve and at least one supply curve, if we are interested in finding the demand curve for any product. We observe prices and corresponding quantities. Presumably every price-quantity point is the intersection between a demand curve and a supply curve. If we are to predict future intersections, we must attempt to understand the demand and supply curves.

If we wish to improve our knowledge of demand curves, it is important that we should not exaggerate the amount of information contained in just the price-quantity observations. To every price-quantity point there corresponds an infinite number of demand and supply curve combinations that could have intersected at the given point.

If we were limited to price and quantity observations, we could never "identify" a demand curve or a supply curve—we could never say about a particular equation: "There is reason for preferring this equation to every other equation, as an approximation to the unknown equation that describes demand conditions." Fortunately, we can observe other relevant statistical series. Under favorable conditions, we can construct curves having particularly strong claims as preferred approximations to demand and supply curves. In at least some problems, the limited information method, perhaps supplemented by complementary procedures, seems adequate for "identifying" demand curves.³ There is good reason to hope that some combination of current methods can provide a reasonably good analytical basis for policy decisions affecting agricultural prices and outputs.

The limited information method is called a simultaneous method, because models on which it is used include at least two equations,

¹ Richard Stone, "The Analysis of Market Demand," 108 *Journal of the Royal Statistical Society* 286, 1945; A. R. Prest, "Some Experiments in Demand Analysis," 31 *Review of Economics and Statistics* 33, February 1949.

² M. A. Girschick and Trygve Haavelmo, "Statistical Analysis of the Demand for Food: Examples of Simultaneous Estimation of Structural Equations," 15 *Econometrica* 79, April 1947.

³ T. W. Anderson and Herman Rubin, "Estimation of the Parameters of a Single Equation in a Complete System of Stochastic Equations," 20 *Annals of Mathematical Statistics* 46, March, 1949.

to be solved simultaneously for certain parameters. The number of equations must equal the number of endogenous variables. Any variable appearing in the analysis is endogenous unless it is either a disturbance (a composite of a number of variables that are not observed directly) or a predetermined variable (one that can be regarded as given for the purpose of the problem being investigated.) We shall undoubtedly treat as endogenous variables the price and quantity of the good whose demand curve we want. If any other good is particularly closely related to the given one in the minds of buyers or sellers or both, we may include equations for the demand and supply of the second good.

Clearly our decision to include or exclude a certain equation involves some judgment. If we proceeded in a certain extreme fashion, we should attempt to deal with supply and demand equations for several grades of cotton. We must expect disagreement on the feasibility of certain degrees of fineness in our distinctions among grades. On the other hand, we may agree that a model used in finding the demand for butter ought to include equations relating to oleomargarine.

Another difficult problem relates to the treatment of social aggregates, such as the national income. Suppose that national income is included in the demand equation for the commodity in which we are interested. Must we deal with an equation accounting for the determination of national income?

In the past, many workers have treated such aggregates as given functions of time, and therefore not to be determined simultaneously with the price of an individual product. On the other hand, Girschick and Haavelmo, in their distinguished study of the demand for food, deprecate such treatment: "We could always split up total consumption into small sub-groups by a sufficiently detailed specification of the various types of consumer goods. Obviously, such a regrouping could not alter the fact that changes in the total consumer expenditures have a direct effect on income, income being the sum of consumers' expenditures and investment expenditures. We must therefore assume that income . . . depends to some extent on the random shifts . . . in the demand for food."⁴

It appears unwise to make a statement as sweeping as that of Girschick and Haavelmo. We must always base our judgments partly on the nature of the specific social problem on which we are

⁴ Girschick and Haavelmo, *op. cit.*, p. 88.

working. Presumably we can agree that a complete description of the operation of our economy would include an account of each market's effect on the national income. But we cannot yet escape from the galling constraint to accept approximations in place of the truth. When we allocate the resources available for an analysis of a particular social problem, it is not obvious that we must always concentrate on getting a relatively accurate representation of the process of determining national income. The price of a group of grades of cotton may have little effect on the national income; accordingly, we may choose to focus our attention on the relations among the prices of the several grades. On the other hand, if we deal with something that we call the market for food, perhaps we must follow Girschik and Haavelmo in writing an equation describing the formation of national income.

However, there is some reason to think that our work in the near future can be most fruitful if we restrict ourselves to small groups of commodities. There is danger that in dealing with agricultural aggregates we may obscure the problems connected with the allocation of resources within agriculture. Successful treatment of broader social problems may have to wait until someone has put aggregative economics into a more satisfactory condition. Before we include aggregative equations in the determination of demand curves, we ought to ask ourselves whether, for instance, there is not considerable justification for Howard Ellis's statement about one of the aggregative relations: "... The consumption function seems to resemble the Holy Ghost: a derogatory attitude toward it is the ultimate sin, but precise information about it is hard to come by."⁵

Setting Up the Simultaneous Model: It is possible to start our statistical work by assuming that we know what variables belong in each of the equations that we propose to use. If we have at our disposal an economic theory that seems to have passed its critical tests well enough for our purposes, there is a fairly strong reason for using the equations appropriate to the theory. But if the theory has not been tested—that is, if it is still properly called a hypothesis—we can only say that we *assume* the validity of the hypothesis. The validity of our findings depends partly on the validity of the economic theory used.

In many cases it will be necessary to choose among economic

⁵ H. S. Ellis, "The State of the 'New Economics'," 39 *American Economic Review*, 476, March 1949.

hypotheses. Stone⁶ and Prest⁷ have used confluence analysis in selecting variables for their demand equations. They assume that every observed variable consists of a systematic part (which may be related to the other variables in the demand equation in question) and a disturbance (consisting of variables like the "y's" in equation (2) above). The systematic part of an observed variable may improve our ability to explain other observed variables; the accompanying disturbance has the opposite effect. Confluence analysis is a method of determining whether the systematic effect predominates over the disturbance effect—and thus whether it is wise to include the suspect variable in the equation under consideration.

If variables are to be selected by the use of confluence analysis, and then parameters are to be estimated by the use of the limited information method, we must remember that the former assumes an error model, while the latter assumes a shock model. In terms of equations (1) and (4) above, the problem can be stated as follows: when we are deciding whether to include the variable I^* does the unrecognized presence of variables $x_1 \dots x_n$ impair our judgment to such an extent that confluence analysis ought not to be combined with the limited information method?

Apparently, no analysis of this problem is available. But there is the following reason for thinking that confluence analysis ought to be retained: the unrecognized presence of $x_1 \dots x_n$ spoils our prediction whether I^* is included in our model or not. Let us make the comparatively mild assumption that each x is uncorrelated with I^* . Then it appears reasonable to expect that failing to consider the " x 's" will have the same effect on our prediction, whether I^* is included or excluded. If this conclusion is valid, the fact that we shall later use the limited information method does not rule out the use of confluence analysis in construction of the model.

In general, there is need for considerable work on the subject of testing hypotheses in economic problems. Suppose a group of hypotheses deal with demand and supply equations. By what Cohen and Nagel call the "deductive development of hypotheses,"⁸ we can "deduce" from a given set of equations some predictions about

⁶ *Op. cit.*

⁷ *Op. cit.*

⁸ Morris R. Cohen and Ernest Nagel, *An Introduction to Logic and Scientific Method*, New York, Harcourt, Brace, and Company, 1934.

future prices and quantities. We shall probably not be able to predict these prices and quantities exactly. But a hypothesis that predicts better than any other over an extended period of time has a relatively strong claim to be used in further prediction.⁹

When we limit ourselves to "predicting" past prices and quantities, it is difficult to choose among hypotheses. If we restrict ourselves to polynomial equations, we can make certain choices. If series x is being used to predict series y , we may choose between a first and second degree equation by observing the improvement in "fit," in relation to the loss of a degree of freedom. But no such procedure is available when we compare the results of two prediction equations, only one of which is a polynomial. It is not legitimate to compare the degrees of freedom in the two cases.

This degrees-of-freedom difficulty seems unavoidable as long as we deal with "fit." But when we use two equations to predict observations that have not been used in estimating the parameters of either equation, it appears that we need not concern ourselves with degrees of freedom. Since the predicted values have not been used to determine the predictions, we may be able to compare closeness of prediction directly.¹⁰

Some variant of this procedure may deserve experimentation. For instance, we may want to go back to using the first $\frac{2}{3}$ of a set of series in predicted certain values in the last $\frac{1}{3}$.

⁹ It is assumed that each hypothesis tested is suggested by some such process as introspection—that it is not chosen by selecting statistical series at random.

¹⁰ However, it might be necessary to refuse to predict when the values of the variables used in predicting fall outside the range of values used in setting up the estimation equating.

USING PRICE RESEARCH

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I HAVE been asked to discuss the use and acceptance of statistical price analyses that have been made in the agricultural field in California by farmers, farmers' organizations, and others for whom the material must in the end be intended.

First, what about the farmer and price research? In most cases he receives only the "answers" of price research in the form of general outlook information. Where prices are not established or supported by government, his price information is most likely to be only qualitative.

Farmers' marketing organizations for handling California specialty crops request and use considerable statistical price analyses as a guide in their operations. What we are talking about here and now is not market information, but statistical price analyses, which measure quantitatively price changes caused by or associated with changes in certain variables. Some of these organizations' particular need for price analyses arises from the fact that their commodity is only marketed during a very short period in the year. In some instances the whole of the crop must be sold at once in a market which has had no transactions for a year. Their market cannot be tested periodically, nor is price focused sharply for them as it is in the case of commodities sold on highly organized exchanges. We might parenthetically say, nor are the commodities they handle designated commodities in Price Support legislation, which, of course, would set up some mark with respect to where prices might be.

Farmers' cooperative bargaining organizations selling processing fruits and vegetables, perhaps, use more statistical analysis in their price problems than most other groups. Their problem is peculiar in that price for their product is usually a negotiated price. Prices are established only once a year for a short season. In between seasons, no price exists. Where should price be established this season? Who knows? That is the problem for the negotiators, and they want what scientific help that is useful—to their ends. We are told by these farmer bargaining organizations that they use these price analyses in crystalizing their thoughts about the market.

Grower organizations handling fresh fruits and vegetables do

not have the same kind of need for price analysis as do organizations selling to processors, who must sell the whole of the crop at once on a cold, unknown market. In the case of citrus, price analyses have long been used by grower organizations to assist in determining a desirable utilization of the season's crop. What is needed and what is lacking, however, is some price analysis to guide action during periods within a season.

Industry Marketing Control Committees. We have in California a number of marketing agreements and orders operating under both federal and state statutes. While the federal and state government officials alone have the power to make the regulations, they do receive and study the recommendations of industry advisory committees. We should point out that with the exception of milk, prices themselves cannot be regulated. However, prices can be greatly influenced by other powers, such as control of supplies and sizes, market stimulation, etc.

What use, then, do these industry control committees make of price research? Usually it is necessary to prepare quite a little analysis of price behavior for presentation at the hearings to institute a program. A survey of opinion indicates that by and large most committees do not use detailed price analyses after programs have been instituted.

Processors, handlers, and their organizations use some price analysis and, in addition, spend considerable funds in obtaining other relevant data. Price analyses are used by several companies as a guide in sizing up the market situation and, in some instances, in determining offering prices to producers. However, factors other than statistical price analysis may and do determine "offering prices." Price analysis is also used by some companies for current situation appraisal, as well as for determining bases for future operations. Some in this group expect to place more reliance upon statistical price analysis as times "become more normal" in this post-war period. Some say they used price analysis to a considerable extent in the prewar period.

In conclusion I might make the following observations:

- (1) In California statistical price analyses are used more by growers organizations and market control program committees than by individual farmers.
- (2) Statistical price analyses for farmers' organizations are perhaps most useful in selling commodities to processors.

- (3) Results of statistical price analyses thus far appears less useful and bargaining more difficult where there are multiple utilizations of the product.
- (4) Farmers' organizations and handlers want more price analyses whether they actually use them or not. They expect them to be more useful as more post-war data become available.
- (5) For general farm audiences the "case" method of presentation receives good attention.
- (6) The author of involved mathematical price analysis designed for some immediate operating problem should himself present the analysis to the operating group.
- (7) Industry groups make little or no use of price analysis to precisely maximize returns. Available data are not exact enough to be definitely sure that returns can really be precisely maximized by any course of action.
- (8) A byproduct of price research is the recognition of necessary and more complete data. Perhaps more cooperation is needed between persons gathering statistics and the analysts.
- (9) It appears to me that the areas of usefulness and the limits of price research are not well staked out. Some folks place more reliance in price analysis than is justified, others are perhaps unduly scornful.

MAKING PRICE RESEARCH USEFUL

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IN COMMENTING on this subject I would like to point out that. (1) in the early stages we asked and were offered too much in our price analysis research; (2) our price analysis research has not made its full contribution during the past decade and a half; (3) the need for the contributions of price research has increased many fold; (4) what we need is basic quantitative economic measurements which the operating forecaster and policy maker may use; and, (5) we should not delay our activities in this field waiting for methods which will give us the same degree of accuracy that may be obtained in the natural sciences.

Price research has not kept pace with the growth in price forecasting or price policy making. We have continued to expand work in agricultural outlook and in agricultural price policy without quantitative price research making the contribution to these activities which it should and could make.

In the 1920's we expected too much. We were looking for a statistical formula to predict prices of individual commodities. Some statisticians in their enthusiasm gave it to us. When economic conditions changed and the relationships and weights assigned to the various factors were no longer applicable to the new economic conditions, the formula forecasting fell into disrepute. With this set-back, caution arose concerning any complicated mathematical approach to price research.

Analyses need to be made by individuals or groups of individuals who are fully familiar not only with statistical procedure but also economic theory and a full knowledge of the characteristics of the commodity involved. We, also, need to make this data available in understandable form to the many individuals working in the outlook and policy fields.

We have before the nation proposals to make direct payments to farmers for the amount the free market price of the commodity averages below the announced support price. Empirically derived supply and demand functions are needed to complete economic models which will provide estimates of the effects (including costs) of such a pricing program under assumed or historic conditions.

These are not mythical problems, they are altogether too real. Discussions are being carried on and decisions are being made without the full benefit of quantitative price analysis research.

If we turn to the outlook field or where price information is used as a guide to private operations where do we find adequate statistical data showing supply and demand relationships? In making an appraisal of the hog outlook, for instance, one really sets up a model, although most of us do not think of it in these terms. We have reasonably good estimates of hog farrowings. Let us assume that we arrive at a forecast of an acceptable level of disposable income. With such a disposable income, what would be a statistically reliable demand function for pork products? Marketing costs are readily predictable a year ahead. The prices paid for pork may thus be calculated and in turn the prices for hogs. I recognize that we have changing demand schedules for pork, but let the forecaster or the operating outlook worker have the knowledge of how demand has operated under various situations.

The point I'm trying to make and to emphasize is that the econometrician should provide the basic pieces of price data which the operating agricultural forecaster and the agricultural policy maker needs to make a quantitative analysis of any current situation. The outlooker and the policy worker must choose what price data or model pertains to the situation involved. The econometrician should be interested in building a large base of fundamental data which those working directly in the applied economic fields may use. I am inclined to believe that there is much useful price data that has been prepared and is being used by individuals working in the price forecasting field that might profitably be published and made available to many others.

Our price research resources call for the use of the most simple, least time consuming techniques. Complex models—by the very fact that they are models and that no one is a “divine mathematician” are simplifications that must be judged with the intuition called experience. We must keep in mind that if they are to be valuable they must be used by others. The use of the simpler methods also leads to a more critical view of the results. In some instances it has almost appeared that the object was to keep the presentation involved. There is less tendency to swallow a brass doorknob if it isn't so elaborately wrapped.

In price analysis we need to break away from the natural

sciences' 95 to 99 percent limits of probability as the key to whether findings are significant. We should not wait until we have reached these limits. There are too many changes with time which the statistical approach probably can never measure, to strive for too high a degree of statistical accuracy in the price area. It is like striving to put a razor edge on a soapstone. The fundamental relationships of the factors used are too unstable to justify too high a degree of refinement.

One cannot discuss the subject of making price analysis research more useful without mentioning the need for more complete statistical data. This includes not only the gathering of data but also making it available in a usable series. We have made much progress in this area; nevertheless, there are still many gaps. The marketing processes should be more fully described. We need more data on governmental action programs, which not only include dollar data but also bushels and acres. We also need more regional information.

Because much of our price analysis is national in scope, I should like to raise the question—do we not need more coordination in price research? Far be it from me to propose that all price research be included and stereotyped into one great project. Yet, maybe we could make more progress and make more fully available the necessary information if we took a partial lesson from the approach used in the development of the atomic bomb. Perhaps the alternative is enlarged activities in the Bureau of Agricultural Economics, closely geared to the more specialized activities carried on in the States.

MEASURING THE INCOMES OF FARM PEOPLE

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WE KNOW something about the incomes of farm people—but not nearly enough. We know approximately what their total income has amounted to in any given year; and from the number of persons on farms, the number of farm workers, or the number of farm operators, we can compute simple arithmetic averages of their individual incomes. But we know very little about how the total income is distributed among farm families. We can also compare averages of farm income with corresponding averages of nonfarm income. But we are not sure just how “comparable” the figures really are.

This lack of detailed knowledge with respect to the distribution and comparative level of farm income arises in good part from the indirect methods that must be used in its estimation. Treating agriculture as though it were a single large firm, we estimate its gross income, its production expenses, and its net income from a wide variety of data on farm production, marketings, prices, and costs that have been collected primarily for other purposes. The method yields aggregates only, in terms of current values prevalent at the farm; and while the results are probably fairly reliable for what they purport to be, they are nevertheless inadequate for some purposes.

For the general purpose of indicating the comparative well-being of farm people, there are three major inadequacies. (1) Lack of state estimates of net farm income, (2) an absence of any satisfactory basis for comparison with nonfarm incomes, and (3) a dearth of acceptable data relating to size distributions. The method used in developing the national aggregates is also adaptable to state estimates; and a start has been made in their preparation. Thus, the only difficult problem in the case of state estimates is that of trying to do the job with insufficient resources.

In the areas of comparison and size distribution, however, some conceptual and statistical problems are as yet unresolved. It is the purpose of this paper to indicate something as to the nature of these problems and to provide a brief summary of the tentative results obtained in several recent attempts at their solution.

Problems of Comparison

In any attempt to compare the absolute levels of farm and non-farm incomes in terms of data now available, three principal questions arise. (1) How complete are the respective totals in their coverage of income? (2) What is the difference in their purchasing power? and (3) What is the most satisfactory unit or basis for comparison?

Completeness of coverage has to do chiefly with the fact that many people receive income from both farm and nonfarm sources, so that a simple average comparison of farm and nonfarm incomes may give distorted and misleading results. The problem may be handled by including all sources of income on both sides of the comparison, or by limiting the comparison to those groups that have but a single source of income. The latter course probably presents more statistical difficulties than does the former in the present state of our knowledge; and it is subject to further objection in that the scope of the comparison is defined in terms of the incomes to be compared.

Other factors to be considered under the heading of coverage are the intangible elements of income associated with the comparative advantages and disadvantages of farming as a way of life. Few would deny that farm life provides a psychic form of income that is not generally enjoyed by urban populations. Is this psychic income wholly or partially offset by economic disadvantages that are not reflected in our income data? The question is not amenable to statistical treatment; but it should not be forgotten in the final analysis.

The question of purchasing power has to do with (1) differences in the composition of commodities and services that go to make up comparable levels of economic well-being on the farm and in the city, and (2) differences in the cost of similar items in the two situations. Paradoxically, the very fact of large differences increases the difficulty of measuring them accurately; and the basic index-number problem becomes especially acute in this case. The theoretical issues involved are well known, and need not be developed here; but the most important practical problem, namely the valuation of nonmoney income, deserves a brief mention.

With the possible exception of members of the armed forces, farmers are the only large group to receive a major portion of their income in kind. Farm-produced food and fuel wood consumed

directly in farm households is ordinarily valued at cost in terms of prices actually received for the sale of similar products. And the occupancy value of farm dwellings, inseparable in the market from the rental or sale values of farms as a whole, is also imputed as something approaching opportunity cost. How are these items to be treated in measuring differences in purchasing power or "cost of living"?

One possible solution is to eliminate them completely from the monetary comparison. That is to say, income on both sides of the comparison could be defined as net money income after deducting all expenses for food, fuel, and housing. The comparison would then be in terms of income over and above that required for some of the basic necessities of life; and if desired, a supplementary comparison of the quantity and quality of the latter could be made in terms of physical instead of value units.¹

On the other hand, if these imputed, nonmoney items are retained in the monetary comparison, the cost-of-living analyst must answer some difficult questions. Retail prices of food normally average about twice as high as prices at the farm which are used in valuing home consumption. And the rental values assigned to farm dwellings have been only about a third as large, on the average, as rents on nonfarm dwelling units. How much of these spreads can be considered as representing real price differentials? And how much is due to differences in quality of the commodities and services being priced? The problem is particularly difficult in the case of rental values because housing available on the farm is frequently of an entirely different kind from that available in the city.

The third major question in any comparison of farm and non-farm income is the appropriate basis for that comparison. That is to say, the aggregates of income, however adjusted, must be reduced to units of comparable size and quality. Should the comparison be in terms of income per person in the total population on the basis of farm or nonfarm residence? In terms of income per worker on the basis of occupation? Or in terms of income per family on the basis of either residence or occupation? Because of the relatively large numbers of children and older people on farms,

¹ Some proposals of this general nature were tentatively suggested by Dorothy S. Brady in a paper presented at the 1949 meeting of the Conference on Research in Income and Wealth.

the large proportion of unpaid family workers in the farm labor force, and the relatively large size of the average farm family, the choice among these or other alternatives obviously will have a material effect on the results to be obtained.

Another question in this connection is whether the comparison should be in terms of simple, nation-wide averages of income, or whether farm and nonfarm incomes might better be compared within each region or state. The latter basis would give results somewhat more favorable than the former to the farm side of the comparison, because a large proportion of the farm population and only a relatively small part of the nonfarm populations are in the south where incomes in general, both farm and nonfarm, tend to be lower than average.

It is no part of the purpose of this paper to try to provide any final answers. But it may be worth while to summarize briefly the results obtained in two recent and tentative studies which attacked these problems on a nation-wide basis.²

In one case, 1941 data on prices paid for family living by farmers and by urban wage earners, obtained primarily from the study of "Family Spending and Saving in Wartime," were combined into weighted index numbers representing the average price differential between farm and city. The 1941 average net income per farm operator from farming was then adjusted downward to eliminate an estimated average value of unpaid family labor other than that of the operator; and the result was compared with the average annual earnings of factory workers in the light of the price differential previously established. The conclusion was that the purchasing power of farmers' incomes so adjusted averaged about 25 percent less in 1941 than that of urban factory workers. Similar calculations for 1945 were also made in this study, using price data translated to reflect the wartime situation; and the results indicated approximate equality of purchasing power as between farm operators and factory wage earners in that year.

In the other study, a series of rather complicated adjustments were applied directly to the BAE data on per capita farm incomes to achieve rough purchasing power comparability with nonfarm

² One of these studies appears as "Farm and Urban Purchasing Power" by Nathan Koffsky in Volume 11 of *Studies in Income and Wealth*, Conference on Research in Income and Wealth, National Bureau of Economic Research, New York, 1949, pp. 153-178. The other is summarized in the "Comment" of E. W. Grove appearing in the same volume, pp. 212-215

per capita income. The results were then adjusted to allow for differences in the regional distribution of the farm and non farm populations and in the average size of the family in the two groups. It was concluded that, for the United States as a whole, real incomes of farm and nonfarm families in the same general locality averaged about equal in 1945, but that a disparity of at least 25 percent prevailed in most prewar years.

In neither of these studies was the comparison based on a functional analysis of income. Total incomes were compared, in other words, without any special attempt to distinguish returns from land, capital, labor, and management on either side of the comparison. In other respects, however, the two studies differed considerably in their approach to the problem. In one case, the labor income of the average factory worker was compared with the average farmer's composite returns on his capital, labor, and management, but exclusive of any income from nonfarm sources. In the other case, average total income of nonfarm families from all sources was compared with the corresponding average total income for families living on farms.

Because of these differences between the two studies in the basis for comparison, their respective conclusions are not strictly comparable. And both, it may be noted, were based on income data that have since been revised. Yet they tend to reinforce each other in pointing to the general conclusion that during the last three or four years farmers may reasonably be considered to have achieved something approaching income equality with the rest of the country.

But this "equality," if real, is only in terms of nation-wide averages of income; and we are not yet able to say very much about income relationships in individual states. Such limited data as are available suggest that during the last few years farmers in certain parts of the Western and North Central regions of the country may actually have been a good deal better off than nonfarmers in those areas. And at the other end of the scale, particularly in certain parts of the South, it seems equally likely that farmers have remained at a substantial disadvantage even during the general farm prosperity of recent years. It is possible, therefore, that average equality for agriculture has been achieved in part at the expense of greater relative inequality *within* agriculture. But firm conclusions on this score are not possible in the present state of our knowledge.

Distribution by Size

Thus far we have been concerned with totals and averages of farm income, and with problems of comparison. But even if we had complete and up-to-date data of this kind, which could be interpreted precisely from a comparative standpoint, the absence of size distributions of income would still prove to be a serious lack. The comparison of average incomes needs to be supplemented with information as to how many of who get how much.

Commonly cited in this connection are the Census of Agriculture distributions of farms by value of sales or by total value of product. These distributions are useful, but they are incomplete. We need distributions of farmers' net income as well as their gross income. And we also need to know how the distribution of farm families by size of net farm income is changed when income from nonfarm sources is taken into account.

The Bureau of Agricultural Economics has done a good deal of work along these lines in recent years. It has recently completed some preliminary estimates of size distributions relating to the income of farm-operator families in 1946. But this is another field in which it is difficult to obtain conclusive answers, and we are not yet ready to say that our results are the best that can be achieved. The preliminary findings were reported to the Conference on Research in Income and Wealth earlier this year, primarily for the purpose of obtaining a technical review of the statistical adjustments applied to the original survey data. As a result of this review further investigations of the data and refinements of procedure are now in process; and the distributions may be materially revised in the near future.

Nevertheless, the results obtained so far seem fairly reasonable, and some of the main findings are not likely to be very much affected by any future revisions. So the following summary of methods and results can be presented with little fear of contradiction in the final analysis.

The distributions were based largely on data relating to farm income and expenses for the calendar year 1946, collected in the Enumerative Survey of Agriculture in January 1947. More than 14,000 usable schedules were obtained on gross cash farm income and about 3,700 usable schedules on production expenses. As in other recent income surveys conducted by other governmental agencies, the BAE survey was characterized by underenumeration of farms and underreporting of income. Underenumeration was not

a serious difficulty because sufficient control data were obtained in the survey to permit expansion of the sample to the number of farms reported in the 1945 Census of Agriculture, using three major size-of-farm groups. It is to be noted that the underenumeration was largely in the smaller farms; this is primarily a reflection of the difficulty of identifying them as farms according to the Census definition.

The heart of the difficulty in constructing reliable size distributions of farmers' incomes lies in the severe underreporting of income which apparently is characteristic of farm income surveys. Receipts are generally understated, partly because of failure to remember the many transactions involved in the farm enterprise during the year, and also because of reluctance to disclose income data. These biases operate with greater force on the reporting of farm operators' income than on the reporting of income by most other occupational groups. Wage earners, for example, generally have fixed rates of earnings, easy to remember and report, and also relatively easy to check. In the companion survey of nonfarm incomes in 1946, conducted by the Bureau of the Census, more than 90 percent of total urban wages and salaries was accounted for in contrast with only about half of total net cash farm income in the farm survey. Under such circumstances, the necessity of adjusting the original distributions is self-evident, especially when comparisons are sought between farm and nonfarm groups.

After expansion to the 1945 Census number of farms, the survey accounted for 72 percent of the aggregate BAE estimate of cash farm receipts, 91 percent of estimated total production expenses, and only 49 percent of net cash farm income. There was a fairly consistent pattern in the extent of underreporting by regions, implying that the sample was rather uniform in coverage for different parts of the country. It is noteworthy that the value of sales as reported in the 1945 Census of Agriculture represented an understatement from the BAE aggregate of approximately the same percentage as occurred in the 1946 survey. Furthermore, the Census distribution of the value of sales is quite similar to the distribution of gross cash farm income obtained from the survey, particularly when allowance is made for the generally higher level of income in 1946.

The BAE totals of gross income, production expenses, and net income are themselves subject to errors of estimation; and the question naturally arises as to the propriety of adjusting the income

distributions to reflect aggregates which are not guaranteed to be correct. Yet the preponderance of evidence is on the side of adjustment. It is a characteristic of income surveys to underreport income, and the underreporting is usually greatest in the case of the self-employed, whether farm or nonfarm. In the 1946 surveys, nonfarm entrepreneurial income was underreported by about the same proportion as farm income. It should also be remembered that the Census of Agriculture is an income survey insofar as it relates to the value of sales or of total product; and as such it is subject to the limitations and biases of any income survey.

The relatively good reporting of farm production expenditures—91 percent of the estimated BAE aggregate—provided the opening step in adjusting the survey results. After raising all production expenses proportionately to reflect the BAE estimate, the corresponding gross cash farm income was determined by means of a relationship between gross cash income and production expenses at each income level determined largely from other sources. The survey covered the nonfarm income of farm-operator families, but excluded nonmoney income. By a series of cross-tabulations, however, and with the aid of data from other sources relating to the nonmoney income from farming, the following distributions were developed which reflected the BAE aggregate estimates: (1) Gross cash income from farming, (2) net cash income from farming, (3) net cash income from farm and nonfarm sources combined, and (4) net total income from farm and nonfarm sources, including nonmoney income from the farm.

In all cases, the distributions after adjustment are more unequal than before adjustment. This is because the available evidence indicated that most of the "missing" farm income belonged in the higher income groups, on the basis of the relationship between cash farm income and production expenses at those levels; and the adjustment was accomplished accordingly.

However, the greatest interest attaches to the lower income groups which were relatively little affected by the adjustment. In the distribution of gross cash farm income, the original survey indicated that 33 percent of all farms had gross cash incomes of less than \$500. After adjustment, the percentage was lowered only slightly to 29 percent. For *net* cash farm income, the original distribution indicated 33 percent with *negative* incomes, and the adjusted distribution 30 percent.

At first glance, the indication that almost a third of all farms had

negative net cash farm income in 1946—an unusually prosperous year for agriculture as a whole—may seem unreasonable. But after reference to the distribution of gross cash farm income, to the standard definition of a farm, and to the distribution of income from nonfarm sources, it begins to appear quite reasonable.

As already noted, nearly a third of all farms had gross cash farm incomes of less than \$500, a proportion that is substantially confirmed by the value-of-sales data from the Census of Agriculture. Approximately two-thirds of all negative net incomes fall in this group with relatively low gross farm income. It should be emphasized that for the most part these farms are not commercial operations. Some are primarily country residences. Others, supplemented by income from nonfarm sources, provide living from the farm in noncash items. The tremendous importance of nonfarm income to this group may be illustrated by comparing its average size at each level of net cash farm income. For those farm operators with negative cash income from farming, the average nonfarm income was \$1,700. At levels of net cash farm income above zero and ranging up to about \$6,000, income from nonfarm sources becomes substantially smaller, averaging around \$500 more or less at those levels. At still higher levels of farm income, nonfarm income again becomes increasingly larger in absolute terms, though it remains a relatively small part of total income at those higher levels. But the most significant point in all of this is that negative net cash farm incomes do not actually mean an excessively low level of total income for any substantial number of families who fall in that group.

Inventories are another matter worth mentioning in connection with negative cash farm incomes. One of the principal gaps in our data relates to the effect of changes in inventories on the distribution of income. The survey was confined to cash items, and did not obtain any information on inventories. But we know from a study of farm-account records in Illinois that some commercial farmers fall in the negative net cash farm income class because they are building up inventories. On the other hand, some farmers were in the higher cash income classes because they were selling out of inventories. Although no precise estimates can be made, the inclusion of farm inventory changes might have reduced considerably the number of farms in the negative income group.

For purposes of comparing the income distributions of farm and nonfarm families, it is appropriate to include for the farm-operator

family all the income it receives—cash farm income, income from nonfarm sources, and nonmoney income received from the farm in the form of food and shelter. It would also appear appropriate to value the food consumed on farms at retail prices to farmers. If all this is done, then the shape of the income distribution for farm-operator families in 1946 turns out to be much the same as that for nonfarm families.

* * *

It was concluded earlier in this paper that the over-all average incomes of farm and nonfarm families have probably had about the same real purchasing power during recent postwar years. And the further conclusion has now been reached that their incomes were probably distributed by size in somewhat the same fashion. But it does not necessarily follow from these two tentative and independent observations that the purchasing power of income was the same at each of the corresponding size classes in the two distributions. Much more detailed studies would be necessary to establish any such correspondence.

Three frontiers in farm-income research have been briefly considered here, namely the development of state totals, the comparison with nonfarm income, and the construction of size distributions. Some pioneer work has been done on all three. But so far the work on any one has been largely—and necessarily—independent of that on either of the other two. If and when the work shall have progressed to a point at which answers to all three can be combined, then, and not until then, will we really be able to measure the incomes of farm people.

REFLECTIONS ON POVERTY WITHIN AGRICULTURE*

THEODORE W. SCHULTZ

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A Summary

The setting of this paper is the American scene, concentrating on the long run and abstracting from sudden changes and fluctuations that occur in the short run. The simplifying empirical propositions on which this paper stands are as follows:

1. The differences in the level of living among communities were not as great at the time people were pioneering new areas or at the time industrialization began as they have become since then.
2. Significant differences have emerged within agriculture not mainly because of a deterioration on the part of those communities in which people are now living under conditions of poverty, but largely because of the increases in per capita income that have been realized by other communities.
3. These gaps, consisting of differences in level of living, are basically the consequences of the way in which the economy of the United States has developed and not primarily the result of any original differences in the cultural values or capabilities of the people themselves.

Each of these propositions is meaningful in that an appeal can be made to empirical experience in determining its validity. The third proposition is central and crucial. The observation is made that the physical characteristics of land are passive in the poverty problem. The drift of prices is also in a passive position.

Can economic progress bring about increasing disparity of income? It could not if we were to take the classical conception of economic progress; that is, increases in aggregate income under conditions where per capita income tends to remain constant. This is the Ricardo-Malthus-Mill, "Dynamics of Political Economy." It is based on two rates of change: (1) power of production and (2) power of population with the power of production in the position of the limitational factor. Given this conception, communities do not diverge in per capita income.

A broader formulation of economic progress consists of increases in aggregate income with changes in per capita income unspecified, except that no community is made worse off. This view includes the Ricardo-Malthus-Mill conception as a special case. The principal analytical problem becomes that of specifying the *conditions that are necessary* for a disparity in per capita income to emerge.

The economic history of Western Europe since 1650 suggests that the advances in technology and in economic organization usually ascribed to the industrial revolution gave rise to (1) a greatly increased aggregate production, (2) a marked increase in per capita income generally in Europe despite the fact that the European population multiplied five times from 1650 to date, (3) an increasing disparity in per capita income between

* The full text of the paper presented at Laramie will appear in the *Journal of Political Economy*, vol. LVIII, February, 1950.

Western Europe (certainly up to World War II) and those parts of the world that had not benefited from the process of industrialization, and (4) conditions which impeded migration of non-Europeans to Europe, a development that would have brought about factor-price equalization to human agents between European and non-European communities had it occurred in sufficient numbers.

We then examine the conditions that are necessary for increasing disparity in incomes to occur. The effects of capital accumulation are indicated. The main analysis, however, concentrates on the following three sets of conditions:

1. Conditions that determine the proportion of a population that contributes to income. The ratio of contributors to non-contributors is affected by changes in composition of population associated with economic progress, changes in continuity of employment and the specialization permitted by division of labor that emerges with economic development, and by the differences ascribable to income measurement and to income accounting.
2. Conditions that determine the abilities of a population to produce. This approach calls for a classification of abilities. The abilities that can be acquired are of central interest. A brief survey is then made of the (1) process by which capital is "invested" in human agents; (2) amount thus invested; and (3) effects of this investment on productivity of a population.
3. Conditions that impede factor-price equalization. Economic progress requires exceedingly large transfers of human agents. An instructive special case is a pre-industrial demographic type of population under conditions that do not necessarily require any trade or factor movement to attain factor-price equalization. Transfer of factors is, however, necessary under advanced industrial demographic type (the Samuelson exception is noted) in order to attain factor-price equalization. There remains the difficult problem of determining the comparability of typical human agents in pre-industrial and advanced industrial demographic communities. It appears that we are dealing with essentially comparable factors with two types of exceptions. One of these occurs when long systematic training for specific skills is required and the other when ability to adapt in the short run is insufficient.

There are basic cultural impediments to factor-price equalization. These involve sociological considerations having costs aspects. For society, the gains to be achieved from paying the costs of reducing these cultural impediments are greatest when these costs are non-recurring for any migrant.

DISCUSSION

ERVEN J. LONG

University of Wisconsin

Professor Schultz' major thesis, developed out of his analysis of the causes operative in creating disparities among economic levels of different

farm communities, is that poverty in rural areas is due to their having been by-passed in the processes of industrial progress. This analysis serves at least one very important purpose. It removes the responsibility for poverty from the individuals so affected, and fixes it upon the public. This justifies work on the problem by economists as being in the public interest, and support of their proposals, if sound ones be found, a public responsibility.

But there are certain methodological implications of the argument which I find quite uncomfortable. They find their clearest expression in the series of comments on what Professor Schultz refers to as "research concentrating on land." However, since I believe, along with him, that his conclusions on this point are necessary logical implications of his formulation of the problem, the following comments should have a bearing upon a much larger array of implications of his argument.

The question I should ask is: what kind of conception of causation can help remove or diminish poverty in agriculture? Implicitly, it seems to me, Professor Schultz' argument conceives of causation as being much like immutable impersonal forces. As we try, following this conception, to unravel the skein of causation involved in the creation of poverty in agriculture, we trace it back through human affairs, halting somewhat arbitrarily on the developmentary processes of the country's economy. We could have, with equal logical precision, traced the pattern of causes by way of the unequal geographical development of the country, back to the uneven disposition of mineral and other natural resources. We thus need come to no logically imposed halting place until we find the explanation of our problem in the beneficence of the gods or the orneriness of the devils, as best suits our disposition. This conception of causation, as the working out of impersonal forces sweeping human affairs on to their destinies, serves quite well in transferring responsibility from the individuals affected to the public. For it is becoming almost a norm of our public morality that we do not allow individuals to suffer unaided the full brunt of disaster-bringing impersonal forces outside their control. For such a purpose, it doesn't matter much where we stop in our tracing out the path of causation, provided only that it is sufficiently far removed from the individuals we are interested in helping.

But the broader problem of finding ways of improving the level of living of the poorer people in agriculture makes more exacting demands upon our method. A conception of causes to be relevant in the problem and to have power in its solution must have its basic focus not upon present circumstances and their antecedents, but upon present possible courses of action and their probable consequence. This consequence-grounded conception of causation has been the uniquely American contribution to logical theory. In logical theory, the pragmatic conception of a cause is that which can be isolated and when brought under control will bring about a desired reconstruction of the situation under study. In the words of the great Chicago philosopher G. H. Mead, "Generally it (i.e. cause) is some condition which can be changed in order to bring about a different result."

If our analyses are to lead to acceptable and workable formulations of policies to follow in reducing rural poverty, they must be couched directly in terms of alternatives available in the situations in which poverty occurs,

and are only indirectly concerned with the "underlying causes" by which such poverty is explained. This consideration leads me directly to the conclusion that our contribution to the solution of the problem of rural poverty will come principally from intensive and systematic inquiry into the potentialities inherent in those situations in which poverty exists. This implies community and area studies bent on exploring the full array of available alternatives open to the poor people living in them. Especially it implies a study of local social and economic processes for an attempt to locate those strategic points at which specific public action can be most effective. (A study recently published in *Land Economics* of a very poor northern Wisconsin community revealed that most national programs designed to serve the general interest as depression remedies actually worked against the long-run interests of the people in the community.)

These public actions might include such general things as encouraging migration to other communities, development of new industries, better balancing of factors of farm production, and a rationalization of the relationship between institutions and the resources already in use. This, as I understand it, has been the principal objective of land economics research. Most such research worthy of the name has concentrated on the way in which land is incorporated as *uses* into the economic organization of the area in question. Far from being unable to reveal causes as Professor Schultz contends, they have, I believe been among the most useful of inquiries revealing causes—in the meaning of "causes" that I have sketched out, i.e. warranted clues to significant social action for relieving the communities' poverty.

It is true that land as such plays a passive role; but the way in which land is incorporated into the economic organization of a community is one of the really dynamic facts of rural life—just as the way coal and iron ore deposits, or isolation-imposing rugged terrain, are caught up in and give differential direction to the developmentary processes of our country's economy. I refer again to the northern Wisconsin community mentioned before. Built upon a combination of agriculture and forestry as the economic base, the institutions of the community took form and solidified. Line fences and farmstead locations defined the scale of operations; legal and political institutions of private property defined the mode of economic organization; custom, habit and culturally acquired tastes made the people immobile and unimpressed by the call of better opportunities elsewhere. This process set the stage for great distress when the forests were depleted and the rich, thin top soil gave out. Analysis of these processes provides, I believe, the only source of clues to procedures to follow in improving the situation. Neither the terrific internal pressures of a disintegrating community economy during the depression, nor the external wartime pull of the people into military and industrial employment, left any significant decline in the number of people residing and trying to make a living in the community. No doubt similar circumstances of poverty induced by maladjustment in land uses—the rigidifying of institutions in situations demanding their flexibility—could be recounted for most important poverty-ridden areas in the country.

I certainly agree with Professor Schultz that agricultural economists

have contributed too little to the solution of poverty in agriculture and that this is not due primarily to coercive political pressure. But I cannot believe that they have neglected the study of rural poverty because, accepting the prevailing folklore, "they do not believe that poverty is an important social problem." I believe, rather, that we have neglected study of the problem because our basic methodologies—the hidden major premises of our research—have been such as to prevent our making powerful advances on the problem.

I have developed at some length the case for intensive investigation of local economic processes. This intimacy of insight into farmers' experiences was achieved in those empirical farm management studies in which more or less agricultural economics was born. But their purposes of improving farmers' judgments in the conduct of their private businesses led to the forging of methods of inquiry adapted to deal with the limited structure of alternatives open to individual farmers, but not adapted to encompass the broader array of alternatives open for public action.

At the other pole, we have seen a great deal of vitality emerge from the application of economic principles of theoretical equilibrium to the problems of agriculture. But this methodology, too, proves inadequate in dealing with the problem of poverty. This is the message we get from the fact that policy proposals repeatedly mention the problem of rural poverty and then issue an honest disclaimer of any important contribution to its solution. This I believe testifies to the inadequacies of the method rather than to the disinterest of the economists.

Why these inadequacies? First, this type of approach serves to define the solution of the problem in terms of a theoretical norm having little reference to the problem as it exists. This flows from the fabrication of this norm (i.e. the theoretical model) from such basic abstract postulates as pure competition, rationality of action (within a narrowly defined meaning of rationality) and perfect mobility of factors of production, including labor. The direction thus given to our analyses of present situations of poverty is to point them toward this completely abstracted, hypothetical state of affairs as being a "solution" to our problem—a state of affairs defined by a system of pure ideas, untested except for their logical consistency, a society without institutions, an economy without organization. Of course, we economists do not actually operate in that way; our minds are too dialectic to follow our methods to their logical conclusions. But some such vague perception of the implications of our methods leads us to detour when we ride theoretical analysis up to the problem of rural poverty. Second, human energies are released and directed into the economy principally by the operation of social processes. In large part, the supply and availability of labor as a productive agent is a by-product of social organization. (This I hope has been demonstrated in a research bulletin on *The Labor Foundations of Wisconsin Family Farms*.) Systematic inquiry into the processes by which such energies take form and are channeled into productive uses is only indirectly aided by a method of formulating the problem which abstracts from their existence. The point we must avoid overlooking is that labor is embodied in people, and the use to which labor is put depends upon the myriad decisions of the individual persons

involved. All that we know of the processes of personality development leads us to the conclusion that the person, and therefore the decisions he makes, is really a function of the social situation in which he builds his personality. Among many people, even poverty itself is held as a value. They perhaps do not think so. But their personalities are so much a function of their social habitat that their decisions, both deliberative and habitual, made out of a craving for what John R. Commons has called "the security of even injustice and poverty," lead to a continuation of the poverty in which they live.

Policies for dealing with these by-passed cells of our social economy must, unless we follow authoritarian procedures, work their way out through the free decisions of the people involved. An understanding of the processes of acculturation which give the particular character to these decisions is indispensable to the formulation of such policies. These processes, being distinctly strategic to the solution of an intensely economic problem, fall thereby directly within the province of economic investigation. We should not, through too critical use of the theoretical-equilibrium method of approaching our problem for analysis, beg this strategic area of investigation by covering all individual action under universal assumptions which give highly particular meanings to rational conduct and to the nature of individual choice.

DISCUSSION

HERMAN M. SOUTHWORTH
Council of Economic Advisers

I think we can be heartened by the papers presented here. The progress of farm income research described by Dr. Grove, and the preliminary estimates that he so tentatively reports, suggest to me that we are on the threshold of obtaining a much better quantitative description of the problem to which policy must address itself. And the insights provided by Professor Schultz in the synthesis that he has developed can, I believe, help us substantially in broadening our future policy approaches.

Legislatively, the time is ripe for a shift from price support over to income support as the basis for major farm programs, if only an acceptable formulation of our income objective can be provided.

Grove's discussion of the effects of making income comparisons within geographic regions is highly relevant to Schultz' analysis. The fact that farm-nonfarm disparities are so greatly reduced when viewed region by region supports the thesis that the basic disparities are between regions rather than between agriculture and other industries.

In one sense, Schultz reduces the phenomenon of poverty in agriculture—defined to include only inter-community disparities—to a problem in economics of location. In another sense he broadens it to typify the whole process of the industrial revolution, and, in effect, takes it out of the realm of agricultural economics. I find his thesis a rather convincing over-simplification, that presents an important class of disparities in farm incomes in a perspective that should be helpful in our efforts to understand this problem.

I should like to throw into the discussion a few policy proposals that

would seem at first sight to have the support of Schultz' analysis. I should not like them to be taken as proposals that I myself would advocate without qualification, since they obviously involve considerations going far beyond the scope of this discussion.

1. The support of farm income through price programs, that now occupies the center of policy consideration, is not designed to overcome poverty in agriculture as Schultz defines it.

2. Schultz places major emphasis upon positive action to overcome the cultural impediments that keep people from migrating from backward to progressive communities. Such action might include:

a. Much greater emphasis upon industrial and commercial, as versus agricultural, vocational education in rural schools in the "pre-industrial" communities

b. The bringing of other modern community services and facilities to such areas, as a measure designed to reduce the unfamiliarity of their people with urban modes of life

c. A program somewhat analogous to that of the Farmers Home Administration, but designed instead to help families that cannot make a decent living from farming to establish themselves successfully in urban employments.

It is not hard to dream up programs like these. The difficulty lies in envisioning how to carry them out without an objectionable amount of Federal paternalism.

3. We might make greater progress by abandoning efforts to deal with agricultural poverty as a *farm* problem and concentrating rather upon measures to reduce the discrepancies in *general* economic development between regions. Where the impediments are too great to moving people out of the "preindustrial" communities, should we not seek instead to bring industry to these communities?

4. I am also tempted to infer from Schultz' paper some support for the Employment Act of 1946, by which my own agency came into existence. The promotion of "maximum employment production, and purchasing power" for the whole United States involves extending to all parts of the country the economic development that Schultz describes as having by-passed many, especially agricultural, communities.

DISCUSSION

JOHN W. WHITE

University of Arkansas

Mr. Grove, in his paper entitled "Measuring the Incomes of Farm People," presented in a very excellent manner the fact that some pioneer work has been done on three frontiers of the farm income measurement problem. The three income measurement frontiers listed by Mr. Grove were the development of state totals, the comparison of non-farm income, and the construction of size distributions.

I have referred to Mr. Grove's paper for the express purpose of emphasizing the point that according to his criteria we have not really measured farm income. Thus, what basis other than generalizations do we have for assuming that poverty exists in agriculture? Professor Schultz assumes that it does exist. I concur, but where? To what degree? And why?

I find no real basis for disagreeing with Professor Schultz's statement

that "differences in level of living are basically a consequence of the way in which the economy of the United States has developed." However, I do believe that Professor Schultz's presentation falls short of pin pointing actual trouble spots in given agricultural communities whether of high or low level of living.

In order to focus attention on the actual problem of poverty in agriculture and to examine some of the more plausible suggestions for solutions to the problem, I would like to take up a few examples.

In the fall of 1944, under conditions of short labor supply, the superintendent of a Southern experiment station found it necessary to haul labor to be used in farm and experimental tasks from a fringe area near the station. Monk Murphy, about 50 years old, was one of the laborers thus recruited. An investigation revealed that Monk lived in a tie-slab shack and had made an investment of \$8 in the construction of the shack. A nice four-room bungalow was available near the experiment station at a rental below the cost of transportation. When asked if he wished to move near the station Monk gave several delaying answers one at a time each good for one week's delay. The first answer was that he could not afford to lose what he had in his house; the second, that he must wait until one of a flock of six hens hatched a setting of eggs, the third revealed that his wife was afraid to move out on a paved highway for fear a car might run over their six year old son.

Finally Monk agreed to move and unloaded his furniture and placed it on the porch of the four room bungalow, which was equipped with good screens, a good water pump and a sanitary outdoor toilet. He came to see the Superintendent and asked if he might place his bed, cook stove, heating stove, dining table and other necessities all in the front room with the explanation that he and his family did not need the other rooms. Thus, Monk set up housekeeping in his new environment.

Even though he was paid each Saturday, it was necessary to advance money about Wednesday or Thursday of each week. If he bought groceries on Monday he did so on a charge account. Monk was a good tractor driver, if someone kept the tractor in repair, saw that it was filled with water, oil and fuel and greased at proper intervals.

By and by Monk failed to see that any good could come from actually working. The station Superintendent found it necessary to discharge Monk. Monk moved to a nearby town and started living in another shack in the town slums.

A more hopeful case is that of Cecil Smith. Cecil, about 30 years old, was a capable farm laborer who had at one time grown rice and cotton as a share cropper. Cecil finished the eighth grade and his wife was a high school graduate. He wanted very much to give his two children a chance to attend school. Cecil was a skilled tractor operator and could with a minimum of supervision do a very satisfactory job on almost any farm task. It was impossible for him to accumulate capital to be used in developing skills for industrial work, for the purchase of equipment to use in operating rented land or for the purchase of a farm. Cecil's major hope or best outlook is to purchase a small farm in a good neighborhood with access to churches, schools and good roads.

Our third example is John Smith, about 40 years old, with a wife and four children. He possessed a debt-free upland farm of 80 acres with 50 acres in cultivation or tillable pasture. Since markets were not available for fruit, truck, dairy or poultry products, his major source of cash income was the production from about 15 acres of cotton. Roads, schools and churches were poor in John's community.

Would a price policy guaranteeing 90 percent of parity for John's cotton solve his problem or alleviate his poverty? I doubt if it would—of course, it might take John longer to starve to death with a 90 percent support price for cotton.

John may need more capital for use in increasing the size of his business. Perhaps this should be supplied on a business basis by the government. Part of the increased capital should be used to purchase mechanical equipment to go with the increased size of business. Public research could contribute much to John's efforts to raise his level of living. A vigorous research program aimed at the development of improved crops, irrigation, proper land use and most profitable combination of enterprises would be helpful. Good local, state and Federal government programs to improve roads, schools and other public services would help. Perhaps John's children should be given an opportunity to prepare themselves for non-farm employment.

Professor Schultz concludes in his paper that society could achieve a *very considerable* gain by taking positive actions (providing the costs are non-reoccurring) to diminish the adverse effects of cultural impediments which influence disparities in income and contribute to the causes of unequal incomes between communities. This conclusion calls for consideration of the double problem of how economic progress could be promoted in low level communities and how we could eliminate or substantially diminish obvious cases of poverty in both high and low level communities.

I would like to leave with you a number of questions which I believe must be considered in dealing with this problem. These questions are:-

- (1) Could the problem be solved in large part by individual farmers through the application of all the techniques available to them?
- (2) Could the problem be solved partially through better education, and through improvement in roads, churches and similar institutions?
- (3) Could the problem be solved partially through a continued and more vigorous program of research and application of such research?
- (4) Could the problem be solved partially through public expenditures for drainage and flood control?
- (5) Could the problem be solved partially through greater industrialization in low income areas and through a better balance between agriculture and industry?

Any solution to the problem of poverty must take into account minority and racial groups in the area concerned. The racial problem is of vast importance and is extremely complex. Is it possible to legislate equality all across the board? The racial question deserves the considered study of our best students. To the extent that poverty exists in Southern agriculture, it is interwoven with the racial question which complicates most of the efforts which might contribute to the solution.

INSTITUTIONAL CHANGES AFFECTING THE AGRICULTURAL OUTLOOK; THE AGRICULTURAL PERSPECTIVE

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ANY attempt in one brief essay at evaluating changes in the basic institutions which affect the outlook for agriculture must be highly selective. We have chosen to concentrate our comments upon changes in two major institutions, general farm organizations and the judicial interpretation of farm legislation.

I count myself among those who use the term "institutions" sparingly; it is a term of many meanings. It is used most often by economists as a blanket term to cover whatever is left over as an unexplained residue after a mechanical analysis has been pushed to its limits. Institutions in this view are conceived of as impediments to the free and full play of economic forces, as the source of inertia in adjustments, stickiness in prices, etc. Institutions are viewed as slowing down the economic mechanism much as long grass chokes up lawn mowers. As I see it, this conception proceeds from the analytical postulate of viewing the economy as a mechanism, presumably governed by mechanical laws which we call forces—forces being equivalent technically to something unknown outside the mechanism.

Obviously, if one is to comment on institutional changes with any systematic reference to economic thought, he must have a conception of an institution which both has some positive and specifiable content, and is relevant to economic investigation. In America, we have had at least two major efforts to formulate systematically a conception of economics which actually incorporated the investigation of institutions into the body of general economic analysis.

One of these was the creation of Thorstein Veblen. He ultimately reduced an institution to a habit of thought, which he conceived of as being a rather natural growth from our habits of work. One might call this a psychological conception of an institution. This viewpoint is to be found at its best, I think, in *Imperial Germany and the Industrial Revolution*.¹ This study, written before the first

¹ Originally published as, Thorstein Veblen, *Imperial Germany and the Industrial Revolution*, The Macmillan Co., New York, 1915.

World War, presented an amazingly accurate forecast of the major European developments since that time. The key, I think, is to be found in the enormous social consequences of "the way we think" about social questions—our habits of thought. Surely, there has been a profound change in recent decades in the habits of thought among our people regarding agricultural policy.

John R. Commons worked out a quite different approach to economics, which is also called institutional. In his analysis, he conceived of an institution as "collective action in control, liberation, and expansion of individual action."² In this general viewpoint, the economy is viewed as a created social organization. Commons investigated many forces of collective action, including public administration, industrial government and trade unions. His *Legal Foundations of Capitalism*³ will likely stand as the greatest published monument to his investigational genius.

In a very profound and yet very different way each of these men was attempting to rise above the limitations of a purely mechanical systematic analysis in economics. All major policy questions are concerned with institutions, with social organization. Public policy formation in a huge democracy such as ours requires the participation of countless pressure groups, along with all the branches of government. Unless economic analysis comes to grips in some fundamental way with the structure of the relevant social action, it can have only very limited influence in the shaping of agricultural policy.

I shall not try to conceal my own inclination to build upon Commons' viewpoint in the analysis of economic institutions. For purposes of this comment I am going to interpret changes in institutions as being equivalent to changes in organized collective action. This includes the conduct of both farm organizations and public officials in the execution of public policies.

Any attempt at evaluation of the effects of changes in institutions carries with it implicitly the idea that we can deliberately and of our own volition give direction to economic affairs. The directing is done through organized effort, through a revision of the working rules by which social activity is organized. The great economic problems of our time have their roots in our elementary

² See his *Institutional Economics*, The Macmillan Co., New York, 1934; and *The Economics of Collective Action*, scheduled for publication in the fall of 1949 by The Macmillan Co.

³ The Macmillan Co., New York, 1924 and 1939.

institutions. We have developed an economic system with vast aggregations of economic power, within a system of property relations designed originally for an era of handicrafts. A laissez-faire philosophy of government in our time leads to economic instability, gross inequalities, and a free hand for economic power.

The changes in farmers' attitudes toward government and their renewed faith in the possibilities of public action, are symptomatic of our times. No one, I think, would claim that we know precisely what to do. It is quite clear to most of us that the new situations require new procedures in social organization. In the most fundamental sense the outlook for agriculture is dependent upon what we do in social and economic organization. The outlook therefore is not a matter of discovering the determinate outcome of mechanical economic forces but rather of anticipating the consequences of deliberate conduct. In the broad view even production and resource utilization are by-products of the social (including economic) organization, for the simple reason that both are consequences of human ingenuity and volition applied to mere matter.

I

As we turn to the discussion of the significance of changes in institutions it is necessary to stake out some particular time span for consideration, preferably a period which might reasonably be called an epoch. And even at best such interpretations can be no more than the beginning general hypotheses for a systematic investigation into the facts of the matter. We shall look back to the approximate close of the first World War, and then attempt an evaluation of present directions by projecting our interpretations about an equal distance into the future. This gives us some rough markings from which we can take our bearings.

In the early twenties, the Grange had a membership of about half a million persons. The Farmers Union had about a hundred thousand and the Farm Bureau about three to 400 thousand members. Each of these organizations was at a different period of its career; the Grange was well along on the gradual climb in membership from the slump in activities of the early eighties; the Farmers Union had dropped from the early flush of members from 1910 to 1920; and the Farm Bureau was in a period of gradual decline which ran from 1921 to about 1934.⁴ Altogether about one million

⁴ Data on membership in farmer movements from David Edgar Lindstrom *American Farmers and Rural Organization*, The Garrard Press, 1948, Champaign, Ill., Part III, pp. 161 ff.

farmers belonged to these movements in the early 1920's.

There was no striking change in membership until about 1940. By 1946, the Grange reported 750,000 members; the Farm Bureau more than a million (1,128,259), and the Farmers Union about 140,000. This gives a total of more than two million members, more than half of which were in the Farm Bureau.

We have the phenomenon of an increasing membership during times of unparalleled prosperity. It has been observed frequently that the growth of farm organizations has represented something of a spontaneous protest of inarticulate but distressed farmers who found themselves helpless as individuals. There is strong evidence in the history of farmer movements to support this thesis.⁵

If one were to investigate the why of this great increase in membership during recent prosperity, he would likely find that this reflects a growing uneasiness on the part of individual farmers regarding their helplessness as individuals in a world increasingly dominated by the great forms of collective action: corporations, labor unions and political parties.⁶ We are undergoing, I believe, a profound change in farmers' habits of thought on this point, and many group efforts contribute to it, including the AAA and the Soil Conservation districts, and membership in their marketing and purchasing cooperatives. One might say that a new class consciousness is developing among farmers; new in the sense that it centers on a newly acquired conviction not only that something can be done by farmers collectively about economic policy matters, but that if they do not work together they will be lost in the shuffle of power groups in the economic order that is in the making.

The recent growth in farm organizations may also reflect changes in the structure of farm organizations themselves. They are acquiring professional secretaries and trained staffs. I do not see how there could be any alternative if the organizations are to deal adequately with the problems that a national organization faces which attempts to contribute to both policy formation and general supervision of the many cooperative and educational endeavors within the province of a contemporary farm organization.

This professionalization of the organizations may be very significant. At best the participating "dirt" farmers will be able to

⁵ See for example, R. L. Hunt, *History of Farmer Movements in the Southwest, 1873-1925*, Dallas, Texas, 1936, pp. III and 142; Solon Buck, *Granger Movement*, Harvard Press, Cambridge, Mass., 1913.

⁶ See John R. Commons' forthcoming *Economics of Collective Action*, The Macmillan Co., 1949.

give only general direction to organizational policies, and even then much would depend upon the willingness of the officials to be so advised. At best also, the directors of the organization will find themselves much like public administrators with a "civil servant" problem in the sense that they will be dependent upon the technical interpretations supplied by their staffs. There are all degrees of possible variation from this optimum. Not the least of the difficulties of organizations in the matter of professional personnel, one may suppose, is the reluctance of agricultural economists to accept employment which might brand them as special pleaders for a pressure group. When an organization arrives at the paid secretary stage the officers take on a considerable management function, speaking for the group on crucial policy questions.

The decline in the importance of face-to-face relationships and the rise to power of a professional leadership group is part of the natural development of organizations. But it opens up the possibility of greater conflicts between the membership and the leadership, an even more likely prospect among farm organizations than among those representing either big capital or labor. Labor organizations have long concentrated on the security of the job; they are now pushing out into politics to supplement, safeguard and expand their job status with more general securities. Big business can concentrate on keeping the restrictions off "free enterprise." But general farm organizations must expend energy in countless places on the economic front, to "protect farmers" by fighting something of a defensive rear-guard action in a triumphant groupistic industrialism.

Farmers have little economic power, even with the present extent of organization. Labor unions and corporations may proceed toward their economic objectives, without active government support, or even in defiance of government. But economic programs for farmers must be details in general political programs. Representatives of farmers must engage continuously in making alliances on specific issues over which there is room for genuine differences in judgment. In a general way organized agriculture is agreed that some kind of national agricultural program is necessary, including at least minimum price supports. Whether farmers as a prospective small minority will continue to be successful in working out the political strategy necessary to achieve such programs is an open question.

Organized agriculture is caught up in larger struggles over which

farmers have little control. The central figures in the great struggles of today and the years ahead are surely as Professor Commons has observed, capital, labor and political parties. Among the general farm organizations only the Farmers Union is openly friendly to organized labor. It is in the cooperative field where the fundamental conflict between capital and labor hits organized agriculture the hardest.

If one attempts to look ahead for two or three decades, what consequences may be anticipated on this capital-labor front that are of major concern to agriculture? I do not see anything except industrial civil war in which farmers might alternate between choosing sides and attempting to remain neutral, except as we develop a new conception of the public interest in private affairs. The outlook is not as dreary as the remark might imply, simply because we are already making that transition. In an age where the employment, inventory and investment policies of our huge corporations can and do materially affect the level of prosperity in an economy, conduct on such matters cannot be considered wholly a private affair. Similarly with labor, it is clear that there is a limit to the extent of strikes that can be tolerated, and correlatively the wage demands that public opinion can reasonably support. On the farm front it is easier for farmers to serve the public interest in their private efforts in economic matters. They can do little else, excepting as they waste the resources upon which the public is dependent. The general principle here is to see that private and public are not contradictory and conflicting purposes. It is at bottom a question of how, when, and whether the private interest also serves the public interest.

Farm organizations also face a whole host of delicate problems in politics. So far, the politics of the organizations appear to be compounded of geography and economics. But farm organizations have not entered openly into politics in recent years as have labor organizations. Organized labor has not only decided to use its political power as a supplement to its economic power, it is predominantly in the Democratic camp. However, the political situation among organized farmers is somewhat chaotic. The Grange operates in predominantly Republican territory. But we have recently been treated to the twin spectacle of having the Farmers Union territory go Republican with a president who has staunchly supported the social legislation of both the New Deal and the Fair Deal;

while the officers of the American Farm Bureau have taken on a fight over the Brannan plan as an early sequel to an election where midwest farmers' votes shifted to the Democrats.

If one can draw an interpretative inference from this political jumble it would seem to be about this: among interest groups only labor approaches the strength required to challenge a political party. With political parties being necessarily so powerful in the years ahead, farmers are likely to place fundamental reliance upon them, and for reasons quite independent of farm organization policies.

II

Twenty-five years ago the fight over the McNary-Haugen bill was nearing a climax. The Farm Bureau had just endorsed the effort. A feud was on between Mr. Hoover, then Secretary of Commerce and the Secretary of Agriculture over the jurisdiction over marketing work. The outcome, as you know well, included the passage of the McNary-Haugen bill by Congress and its successful veto by President Coolidge. As a part of this same struggle, the B.A.E. was "reorganized" with H. C. Taylor moving on to other fields.⁷

The history of agricultural legislation since that time is so familiar to all of you that I shall not take your time to comment extensively upon it. But there have been some significant developments in the judicial interpretation of legislation with which we may not be equally familiar.

Agricultural economists were forcibly reminded of the existence and power of the U.S. Supreme Court in the Butler case⁸ in 1936 which demolished the production control and processing tax features of the first AAA. The majority held in this case that agricultural production was a matter of state concern, and was not included among the powers delegated to the federal government. The marketing agreements authority of the AAA was not affected by this decision. Since that time the AAA has taken a swing toward conservation, but the drift of events has kept pushing this program back toward price supports, acreage controls and marketing quotas.

The authority of the federal government to regulate market transactions in agricultural products and fix prices seems thoroughly

⁷ See Orville Merton Kile, *The Farm Bureau Through Three Decades*, The Waverly Press, Baltimore, 1948, Chap. XI, "The Battle for McNary-Haugenism."

⁸ U.S. vs Butler, 297 U.S. 1 (1936).

established, provided only that due process of law is observed and delegation of legislative power is avoided. The leading cases in this area at present are those involving the regulation of fluid milk markets under federal order in New York City and Boston; the Rock-Royal and Hood cases.⁹

The critical question in the Rock-Royal case was whether Congress had violated the federal constitution by delegating legislative authority to the executive in the office of the Secretary of Agriculture. The majority held that no such delegation was involved. The court noted the general purpose of the Agricultural Adjustment Act to establish parity prices and included in their opinion the statement of purpose familiar to all of you.¹⁰ The court recognized also the particular provisions of the law for calculation of the parity price of milk but observed that: "This price cannot be determined by mathematical formula but the standards give ample indications of the various factors to be considered by the secretary."¹¹

The general rule which the court accepted in dealing with "questions of economic adjustment" was stated as: "In dealing with legislation involving questions of economic adjustment, each enactment must be considered to determine whether it states the purpose which the Congress seeks to accomplish and the standards by which that purpose is to be worked out with sufficient exactness to enable those affected to understand these limits."¹²

The court compared the Agricultural Adjustment Act with the former NIRA, which it disposed of in the famous *Schechter* case. The court noted that the purpose of the AAA was "to restore parity prices" and that the "terms of the orders were limited to specific provisions, minutely set out."¹³ On the contrary the declaration of policy in the NIRA was couched in the most general terms including "to eliminate unfair competitive practices, to promote the fullest possible utilization of the present productive capacity of industries, to avoid undue restriction of production (except as may be temporarily required), to increase the consumption of industrial and agricultural products by increasing purchasing power, etc."¹⁴ The significance of this comparison will be evident if it is recalled that the NIRA was declared unconstitutional on this spe-

⁹ *U.S. vs Rock-Royal Cooperative*, 307 U.S. 583, 1938; *Hood & Sons vs U.S.* 307 U.S. 588, 1938.

¹⁰ U.S. 307, 574-575.

¹¹ *Ibid.*, p. 577.

¹² *Ibid.*, p. 574.

¹³ *Ibid.*, p. 575.

¹⁴ *Ibid.*, p. 575.

cific question, namely the delegation of legislative authority.

The general conclusion with respect to the Court's stand on the delegation of authority is clear: where the Congress indicates with sufficient exactness the purpose of legislation and the methods by which that purpose is to be worked out, the Secretary of Agriculture is considered to be merely carrying out the indicated will of Congress.

As I study these cases two inferences emerge as of major concern to our discussion today. One, the power of the federal government to regulate and fix prices is established solidly, provided the procedure does not violate the constitutional provisions of the separation of powers and honors due process of law. But this suggests the question, just how specific does the price formula have to be to avoid delegation of authority? It is impressive, to put it mildly, how the court fastens onto the concept and formulae for parity prices. Now we have in this association heard a great deal of criticism of parity prices. Several members have given attention to alternative price criteria, notably forward prices. The question arises as to whether the court could, or would, find that a price support program based upon forward prices would qualify under its general rule for legislation on economic adjustments, namely, that the "standards" by which an exactly stated purpose is to be worked out are stated "with sufficient exactness to enable those affected to understand these limits."¹⁵ The proposed forward price program includes (a) the granting of authority to an administrative agency to determine and enforce (as minima) authoritative equilibrium prices, and (b) equilibrium prices are defined in the technical economic terms of ideal prices which would equate marginal costs and marginal returns in agricultural production.¹⁶ If one takes the Rock-Royal case as the criterion, I doubt whether the forward price proposal could be drafted with sufficiently obvious content and exactness to meet the constitutional test on delegation of powers on any issue of regulating prices.

In two cases subsequent to the Butler case which invalidated the major part of the first AAA the government's right to enforce production control regulations has been clearly established.¹⁷

In the first, a North Carolina case on tobacco, marketing quotas

¹⁵ 307 U.S. 574

¹⁶ See Gale Johnson's *Forward Prices for Agriculture*, University of Chicago Press, 1947.

¹⁷ *Milford vs Smith*, 307 U.S. 38 (1938), and *Wickard v. Filburn*, 317 U.S. 111 (1942).

were accepted by the court as falling completely within the congressional authority under the interstate commerce clause, as the procedure for making allotments was spelled out so as not to "confer unrestrained arbitrary power on an executive office."

In *Wickard vs Filburn* the court appears not only to have sustained marketing quotas but to have gone the whole way in recognizing the right of the government to regulate production. Mr. Filburn, an Ohio farmer, had planted 23 acres of wheat with an acreage allotment of 11.1 acres. He fed the excess marketing surplus of 239 bushels, preferring not to take advantage of the loan provisions. The court ruled that he was subject to the penalty of \$.49 a bushel or \$117.11. The opinion was unanimous.

In this opinion the court concluded with the following declaration of policy which may have wide application:

"That the appellee is the worse off for the aggregate of this legislation does not appear; it only appears that, if he could get all that the government gives and do nothing that the government asks, he would be better off than the law allows. To deny him this is not to deny him due process of law."¹⁸ Professor Sears in his recent review of Supreme Court Opinions¹⁹ noted that this opinion seemed very important, "perhaps the most important opinion under the commerce clause since Chief Justice Marshall delivered his memorable opinion in *Gibbons vs Ogburn*"²⁰ in 1824.

I do not present these remarks on the court decisions as anything more than suggestive comments. But surely the decisions are not to be taken lightly. And it is no real criticism of the cases to observe that the court may again change its collective mind on these questions as the times and the composition of the court change. In our system of political economy it is left to the supreme court to rationalize such changes in the rules as may be necessary to permit the orderly transformation of our society. This is the great safety valve in our economic system, and is ultimately the means of orderly rather than violent revolution.

III

If one were to deal at all adequately with the significance to farm people of prospective institutional changes, he would have to con-

¹⁸ *Wickard vs Filburn* 317, U.S. 111.

¹⁹ Kenneth C. Sears, "The Supreme Court and the New Deal: An Answer to Texas," 12, *University of Chicago Law Review*, 148, 1944.

²⁰ *Gibbons vs Ogburn*, 22 U.S. 1, 1824.

sider many more aspects of collective action. In the broad view it is clear that we are engaged in the tremendous task of changing the working rules of economic organization in an effort to cope with the problems of a new era. Since the first World War, we have made a strenuous effort to reduce the instability and insecurity in American agriculture and in the economy generally. The problems for agriculture have been complicated by the ominous fact that farmers are little folks in an age of great combinations. However, as I read the record, I have no doubt either that we can or will in the proximate future avoid depressions of the magnitude of those of the '20's and '30's. The relatively bright outlook for agriculture is darkened only by the contingency of war on a grand scale. Barring this catastrophe the major task of economic policy is that of changing the working rules to twentieth century specifications.

CURRENT INSTITUTIONAL TRENDS IN BUSINESS

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I SHALL begin this paper with a definition and a premise. The definition has to do with the word "institutional." By institutional trends in business, I shall mean (1) changes in the size and scale of the enterprise unit, (2) changes in ownership form (i.e. individual, corporate, cooperative or public) and, (3) in the method by which economic equilibrium is achieved.

My premise is that economic institutions are the result of, and are shaped by, the technology of the times. Since commerce and industry began, commercial organization has gone through several cycles of change. Economic historians tell us, for instance, that the framework of modern big business has been sketched several times during the past 2,000 years. The small, specialized business unit has dominated the trade of one era, the large and far-flung enterprise has dominated the trade of another. And back of these changes in business organization have been changes in the techniques of production, communication, transportation and distribution as they were developed in each of these eras.

I am aware that there are many who contend that economic institutions can and should be *consciously* shaped according to some set of eternal verities or moral values which men try to define in terms of good and bad. I am not of this school. Basically, though to some extent an over-simplification, I think it is true that the economic history and progress of mankind is to be explained in terms of economic determinism. If we must think of economic institutions in terms of good and bad, and these are very intangible concepts, my view is that those institutions and forms of economic organization are best which are most likely to develop and utilize modern techniques of producing and distributing economic goods and services.

The most important economic development of the past 50 years is the tendency toward greater size and scale in all parts and phases of the economy. This is true in business, in labor, and to a lesser extent, in agriculture. Without such an increase in enterprise scale, modern techniques of mass production and mass distribution could not possibly have been applied. Yet there continues in many quarters a prejudice against economic size per se—whether exemplified in big business, big labor, or big agriculture. This unreasoned preju-

dice is traceable in large part, I think, to a failure to understand the nature of economic institutions and why they never can or should resemble those which prevailed 200 years ago.

It is important first that we make clear the universal nature of this trend toward scale. In industry, it has mainly taken the form of corporate growth; in labor it is exemplified by the federation of individual workers into unions capable of wielding economic power on an industry-wide basis; and in agriculture, both by an increase in the size of the family farm, and by the agricultural cooperative movement. It is important also to realize that in business organization, this increase in scale has taken place at *all* size levels. Enterprises of scale are not confined to the so-called national companies, although this is what people commonly have in mind when they refer to big business. Probably even more important is the less publicized increase in the average size of what we ordinarily refer to as "small" business. For the truth is that much so-called small business is not small at all, if by that that term we have in mind an enterprise the capital for which can ordinarily be supplied by one or a few men. Certainly a locally-owned manufacturing establishment worth a million dollars and employing upwards of a hundred people can hardly be called a family-sized unit. But except for the fields of agriculture, retail distribution and the services, how much of our economy is today comprised of units smaller than that?

What is back of this trend toward larger business units? The answer to increasing scale throughout our economy is to be found in modern technology, which has broken apart the business forms and institutions of a by-gone era and forged new ones to give itself expression.

One could go on all day listing examples of how technological innovation has been related to subsequent changes in business forms, and I shall confine myself here to only a few examples from the food industries. The meat packing industry as we know it today owes its origin to the introduction of the refrigerator car about 1875, which made it possible to concentrate livestock slaughter in the production areas. With slaughter thus concentrated geographically, it was possible to apply mass production methods to the slaughtering process and the reclamation of animal by-products. Likewise, the mill roll and separation of flour by means of air current, plus the application of modern power, took the flour milling industry out of the grist mill era. Vegetable canning, bread baking, cheese processing—the most modern and efficient tech-

niques for doing all these things require single plant expenditures running into the hundreds of thousands and even millions of dollars.

Equally important as a factor in the growth of large-scale enterprise have been the techniques of mass distribution. As a matter of fact, economies of distribution are probably more important than economies of plant production in the evolving of companies from a local to a regional to a national basis. Here again there is a technological basis so obvious that its relevance is seldom noted. For instance, why didn't chain stores and mass distribution evolve 100 years ago? The answer is simply that mass distribution could evolve only with modern techniques of record keeping, of communication and transportation. Imagine if you can, trying to conduct mass retailing without the typewriter, the adding machine, the cash register, and the automobile.

Another factor to be noted is the relevance of technology for the function of business management. Modern means of communication make it possible for the skills of management to be extended over a business enterprise which is national or even international in scope. One of the important factors in the growth of large enterprise is the use of specialized skills in management—special skills in merchandising, production, purchasing, research and all other elements that go to make up business operation. Not even a genius can combine all these special management skills. Here again some of our old economic principles are wrong when we try to apply them today, because classical economics taught that management was a limiting factor to the size of business enterprise, and they wrongly applied to the factor of management the principle of diminishing returns. As a matter of fact, the economic principle of division of labor is as applicable to the function of management as it is to hand labor, and the curious failure of some of the older economists to observe this may have been due to the fact that in those days the prevailing technology did not permit geographical extension of the management function.

By emphasizing technology as a factor for larger size in business enterprise, I have not meant to leave the impression that there is not an important place in the economy for small enterprise. Small enterprise is, and probably will continue to be, the predominant enterprise scale in many lines.

In agriculture, for instance, modern machines for production—the tractor, the combine, the corn picker, the milking machine—can be efficiently used on a family-sized unit. The most efficient

machines it would be possible to design for these types of work probably would require large amounts of land and capital, but this efficiency factor difference has not thus far proved sufficient for large-scale farming to make headway comparable to large-scale enterprise in many lines of industrial manufacturing.

Similarly, there are many parts of industry, particularly in distribution and the services, where technology has not been compelling in its effect on economic institutions. The most important development in food retailing during the past 15 years has not been the growth of regional and national chains as it was during the decade of the 1920's, but rather an improvement in the methods and efficiency of the independent retailer. Self service retailing and the integration of the wholesale and retail function through the cooperative efforts of independent retailers have given them as well as the corporate chains many of the advantages of mass retailing.

In the field of industrial manufacturing, there is of course a mixed picture. In some of the heavy industries—automobiles, steel, airplane construction—modern production methods leave no place for what can properly be called small-scale enterprise. But there are many lines of fabrication and processing where this is not true, and where medium-sized and even small units can compete on the basis of approximately equal productive efficiency.

This is especially true in the field of food processing, which explains why most lines of food processing are a healthy admixture of hundreds and even thousands of firms, ranging in scale from family-sized units to national corporations. One cannot describe in a paragraph the business pattern in the food industries, because each line is different. But generally speaking, you will find in every major line from three to ten concerns operating on a national basis; then a considerably larger number, similar in structure and using similar techniques and distribution, operating on a regional basis; and finally, hundreds of smaller independently-owned units, varying widely in size and type, doing business on a local basis.

From the standpoint of the number of firms involved, and the variety of techniques of production and distribution to be found, the food industries are probably the most competitive of any major sector of the economy. Concentration of control has not proceeded as far as in some other industries, and for technological reasons probably never will. This does not necessarily mean that the food industries are serving the people any better or any worse than other

sectors where the organizational pattern of business is different. All I am saying here is that the number of firms and their pattern as to size and type is more diverse in foods than in most other major lines.

I want to move now to some observations regarding the applicability of economic theory to modern business organization. The main purpose of economic theory should be to enable us to understand, appraise and improve the economy. And I submit that for that purpose, much of our economic theory today is either inadequate or downright misleading.

When the older economists laid out their theory of value, they ordinarily dealt with the matter of price and output under two assumptions as to competition. On the one side, they took what the economist calls perfect competition, i.e. a large number of small firms no one of which has enough volume to influence price, and on the other side they put single-firm monopoly. Then under the assumption that the small firms and the large firms used approximately the same techniques of production and that the supply function would be the same in both cases, it was easy to demonstrate that the output of a commodity would be larger and its price lower under conditions of perfect competition than under conditions of single-firm monopoly. From this false set of cost assumptions, they and some of their modern followers went on to conclude that any departure from the conditions of perfect competition as thus defined was not in the public interest. The final step in such reasoning is to conclude that a reduction in the number of firms, or an increase in concentration of control which is the same thing, is necessarily bad.

The first thing wrong is the wholly unrealistic assumption as to the cost function. Imagine if you can, the cost of making all the parts of an automobile and then putting it together under conditions of perfect competition as an economist defines that term. Put another way, would you rather buy a car off the assembly line in Detroit, or one put together by a garage mechanic from parts made in 10,000 blacksmith shops? This is an extreme example, but it illustrates how utterly ridiculous it is to draw a line on a piece of paper representing a hypothetical supply function, and then another line to represent the demand function with rectangles and squares and triangles—and from this to draw the most solemn conclusions as to price and output under conditions of perfect competition versus duopoly or oligopoly.

Under the heading of oligopoly theory, some of the later theorists have attempted to give us a set of tools more adequate to the understanding of price making in a modern economy. They say that under oligopoly, the solution depends on how any one of the firms involved may react to the action of its competitors, and since this is neither knowable or predictable, it follows that the outcome as to price and output is indeterminate. Another way to say this is that oligopoly may lead to conspiracy to fix prices, to wholesome competition, or to cut-throat competition, and on the basis of economic theory no one can tell which or where or when one or the other of these situations is most likely to prevail. And when the problem is further complicated, as in reality it is, by taking the cost function into account, who can say on the basis of economic theory at what point concentration of control is inimical to the public interest?

I stated at the outset that the most important institutional change in business is the trend toward greater scale. The second most important change, as I see it, is a greater rigidity in the structure of costs and prices. In my opinion, price levels will never again be as flexible as they were 30 or even 20 years ago, and I don't think any of us really want them to be, although there are some dangers in the direction we are drifting.

Many people associate price inflexibility with the growth of large scale business enterprise. But this has not been the major factor, nor even a very important one. The chief reason for price inflexibility is cost inflexibility resulting from the power of organized labor to influence and control hourly wage rates. In saying this, I am not passing judgment on the matter, but simply pointing out that business today no longer exercises the control it once did over its major cost factor, wages.

One can scarcely pick up a newspaper these days without finding a pronouncement to the effect that prices to consumers have not fallen as much as they should have, and that business is somehow to blame. Currently the food industries are the most common targets for charges of this kind because the spread between the farm and retail price of food has held steady as farm prices have started to decline.

Usually in these charges there is the implication that business profits are too high. In the food field, the net profits of processors are averaging from two to three percent per dollar of sales; and for food distributors, between one and two percent. You can argue that this level of profits is too high or too low; but you can't argue

that a reduction, or even the abolishment of profits in the food field would lead to any significant reduction in food prices. This is so obvious that it hardly merits mention before a group of this kind, but for the amount of newspaper space recently taken up with pronouncements to the contrary.

If food prices or the prices of goods and services generally are to be significantly reduced in the short run, it can come about only through a reduction in the price of raw materials or of wage costs. It has become the policy of government, probably not soon to be abandoned, to put floors under the prices of many of our raw materials, especially those grown on farms. Again I am not passing judgment, but only pointing out another major cause of price rigidity in our economy.

These two developments—more rigid wage rates and raw material prices externally controlled—have great significance for business management. They mean first that the business concern has lost in considerable measure the control of its cost elements. Business is, therefore, considerably more vulnerable to changing economic conditions than ever before. Industrial profits today are being made under conditions of approximate maximum output, with a high break-even point and with relatively inflexible costs. This is not necessarily a prediction of disaster, but it is important that government and labor and agriculture as well as business realize that when a piece of metal is too rigid to bend, it must sometimes break. I am aware that there is a broad and growing school of thought among economists and leaders in all industrial fields who believe intelligently and sincerely that with proper economic statesmanship we can maintain conditions of full employment under a comparatively rigid price and wage structure. I am partly of this belief myself, but with the qualification that we are on new and somewhat dangerous ground in this matter of economic adjustment.

This much is certain: *We cannot have a falling or a rising price structure without a falling or a rising cost structure.* And I further believe we cannot forever guarantee and maintain a fixed level of prices by means of government expenditure and deficit financing without some day going bankrupt in the process. In times past and under a different set of economic institutions, the necessary adjustment of price levels to effective demand, and of costs to price levels, was made by the blind exercise of economic forces—but made nevertheless. Today economic adjustment is in considerable part

the outcome of bargaining and negotiation between corporations and labor unions and cooperatives, with the government itself increasingly a participant. Under these circumstances, economic adjustment is no longer automatic, but in large part administered or negotiated or legislated. This is inevitable and I think our economy can cope with it. But economic power in the hands of whatever group, including the government itself, can be a dangerous thing unless directed wisely and, to a greater extent than heretofore, unselfishly. I believe our economy will stand or fall on this issue, and I am one of those who think it will stand.

What does all this mean for the individual—in terms of his material well-being, his economic security, the satisfaction of his ambitions?

The main purpose of an economy of whatever kind—be it one of small business, large business, free enterprise or socialism—is to turn out the largest possible supply of goods at the least cost in terms of human effort, and then to distribute these goods in accordance with the contribution of those who have helped to produce them. The first test for any set of economic institutions is the extent to which they serve the material needs of the people. And the first requisite for this is that our economic institutions permit the development of and give expression to those techniques of production and distribution which are most efficient in a physical sense. Measured by this standard, the performance of American business enterprise is unmatched.

On the second count—economic security for the individual—there is considerable room for improvement. The quicker all of us come to admit this and get down to doing something about it in commonsense terms, the more secure our free enterprise system will be. Business itself can do a great deal—and much has already been done—to regularize and plan production schedules so that employment is as regular and steady as management can make it. But this in itself is not enough, because management cannot guarantee employment in the face of financial loss.

Those who oppose additional social security, with funds contributed jointly by employees, employers and government are a small and diminishing band. But in this altogether laudable objective of great economic security for the individual, let's not overlook two things. The first is that social security, like other good things, represents a cost to society; and we must pay for it in part by deductions from our wages, in part by having its costs added to the prices

of the goods we buy, and in part by additional taxes. Social security is not something that can be squeezed out of business profits in some magic fashion. Moreover, we must be on guard against justifying indolence in the name of social security.

Finally, our economic institutions must give incentive to the individual and the enterprise group. This is the essence of the free enterprise system and the thing which chiefly distinguishes it from the various forms of socialism.

One of the criticisms commonly made against corporate enterprise versus small individual enterprise is that it stifles the individual. It is one of our traditions that the goal of achievement in business is to own and control an enterprise of one's own, and when young men seek the advice of their elders they are in most cases still solemnly advised to go into business for themselves. It is time we looked at this, too, in more realistic fashion. For the truth is that only a very small percentage of people can ever be individual enterprisers in this sense because ours is no longer predominantly an economy of small business.

Some of you may have seen the results of a recent poll of college graduates conducted by *Fortune Magazine* in which a majority indicated their preference for work with large corporations, or with the government or in the field of education, in preference to going into business for themselves. The poll-taker was somewhat worried that the spirit of enterprise was going out of young men, though I think his fears were groundless. The important thing about this poll and the point I want to make in connection with it is that an increasing number of people think they can find satisfaction for their ambitions by working within groups and organizations rather than as individuals.

What I have tried to demonstrate in this paper is the relationship between men, machines, and economic institutions. It may seem an oversimplification, but I think basically the relationship is a causal one. Through their ingenuity and resourcefulness, men have developed a technology requiring greater scale of enterprise. Economic institutions adequate and proper to the simpler technology of an earlier age have had to give way to modern business and industrial forms of organization. Changing institutions have in turn had their effect on men, their ideals, their values and their relationships to each other. In short, under our private enterprise system we are moving from economic individualism in the old sense to economic groupism.

LABOR'S AIMS AND WHAT THEY MEAN TO AGRICULTURE

DONALD MONTGOMERY

UAW-CIO

YOU ask me to discuss developments in organized labor that affect the outlook for agriculture.

I shall conclude: 1, that agriculture need not expect organized labor to accept a reduction in wage rates; 2, that agriculture need not fear that organized labor will join forces with those who hope to drive farm prices down; 3, that agriculture should welcome and share in organized labor's primary objective, which is the maintenance of continuous and expanding full production and full employment year after year.

These conclusions are based upon a review and interpretation of labor's progress toward increased purchasing power over the last 35 years. After reviewing that progress, I shall try to interpret for you labor's experience in these years and the new objectives that have grown out of this experience. Then we can see what it means to agriculture.

I

The record of labor's progress toward increased purchasing power since 1914 shows:

1. Until 1944 there was an almost unbroken yearly increase in the hourly wage. In only seven years did the money wage fail to increase, and in only four (not the same) years did the real wage fail to gain.

2. Labor has won more through increased wages than through falling prices. In 23 of these years prices were rising, and in those years the increase of the real hourly wage averaged nearly four index points a year. In 11 years of falling prices, the real wage increase averaged less than two index points. In short, labor did better in good times than in bad times. It has not been proved to labor that it can make progress by accepting a stable wage rate while waiting for industry or agriculture to reduce prices.

3. Buying power of the hourly wage held up well during the depression, but this did not prevent a disastrous fall in the buying power of total wage income. This was the beginning of an experi-

ence which has had great significance in shaping labor's present objectives.

4. Labor won a striking increase in its hourly wage rate in 1934. This reflected the declared policy of the government in favor of higher wages and in support of labor unions. Such official support was an important new experience for labor.

5. Another major increase in the hourly wage took place in 1937. This followed the first large development of industrial unions and the invasion of the basic open-shop industries by organized labor. Union membership had dropped from five million in 1920 to less than three million in 1933, but in 1937 it suddenly increased to seven million. Organization continued after 1937 and the hourly wage continued to rise.

6. From 1939 to 1944 the rise in the hourly wage was quite overshadowed by the great increase in buying power of total wages. Here was concrete experience with full production and full employment. Here was proof of what full employment could mean.

7. After 1944 came the first significant decline in the real hourly wage during all this period. The 36 cent rise in money wage since 1944 was wiped out by price increases. The reduction in hours and employment resulted in a 30 percent reduction in the buying power of total wages. This is another important chapter in labor experience creating a primary interest in full employment.

8. While the money wage and the real wage both made gains between 1948 and June 1949, the buying power of wage income fell because plants were shutting down and workers were being laid off. This rounds out the experience which began with the depression 20 years ago.

II

Now let us clothe this statistical skeleton with living issues. What new purposes has labor discovered out of this experience?

1. There is, first, the proof that organization pays. Compare, for example, labor's gains during the alleged prosperity of the '20's with the gains it made during the limited recovery of the '30's. In the earlier period union membership fell from five to three million. It rose from less than three million in 1933 to nine million in 1939. Increase of the hourly wage in the later period was $3\frac{1}{2}$ times its increase in the earlier years. Buying power of the total wage increased 50 percent during the '20's; 100 percent from 1932 to 1939.

Success of industrial unionism in basic mass production industries was the key to this striking success in the 1930's. The strongholds of monopoly power and the open shop had been breached. Labor had effectively challenged the anti-labor low-wage policies of these basic industries.

2. The war and postwar years brought labor new experience and new interest with respect to prices. Both wages and prices were under government control during the war. These controls were tied together. Labor had to concern itself with both, and gained a lively awareness of the difference between money wages and real wages. Out of this experience labor's postwar wage demands called for increased real wages to be paid out of profits without an increase in prices. This labor objective was based on the belief that distribution of the proceeds of full production must provide purchasing power sufficient to support full production. But industry rejected this proposal. After dealing price control its death blow in the early months of 1946, key industries took the lead in agreeing to wage increases which, round by round, they used as an excuse to increase their prices and to add to their profits.

Many people were convinced by this experience that industry was right when it said wages could not be raised without raising prices, the proof, to them, being that industry *did* raise prices whenever it raised wages. But organized labor was and is convinced of the soundness of its wage-price-profit proposals. For it has seen the tremendous profits which industry made as its price increases cancelled out wage increases. It has seen the resulting decline in buying power of wage income. It has heard industrial leaders say that they must accumulate profits in boom years in order to provide dividends for the bust years which will follow.

3. This experience gives rise to labor's primary new objective—that affirmative measures can and must be taken to eradicate booms and busts and to maintain production and employment at rising capacity levels year after year. The lesson was learned in three stages.

The depression which began twenty years ago convinced most people that something must be done to prevent the waste of human labor and the human misery of such catastrophes. That was lesson one. Lesson two was the experience of full employment during the war—if we have it for war, we can have it for peace. The postwar decline in labor's buying power, followed by the closing of plants

and the laying off of workers, provided lesson three—that something more than the voluntary performance of private enterprise is necessary to prevent booms and busts and to make full production and full employment a continuing reality.

Labor knows that booms and busts are not gifts of nature, but man-made. It believes that what is man-made can be man-controlled. In place of the controls imposed on the economy by leaders of big business, it calls for controls in which all economic groups may participate. For the *private* planning by monopoly industries, it would substitute responsible *public* planning. It urges that government fiscal policies be designed to stimulate levels of consumer buying power and investment adequate to support full production and to promote its expansion.

Private enterprise also welcomes government aid, indeed demands it. Labor's program differs only because it wants government as a full partner in the process. It is business, not labor, that has been inviting the government into private enterprise all these years, but always on a heads-we-win-tails-you-lose basis, beginning with Hoover's Federal Farm Board and Hoover's Reconstruction Finance Corporation 20 years ago. Labor's plan is radical only in that it would have government promote successful enterprise, not merely mop up the failures.

These full employment objectives of labor are spelled out, though imperfectly, in the proposed Economic Expansion Act of 1949, recently introduced in Congress. It proclaims purposes which we endorse, but tends to leave government as the silent, rather than the active, partner to private enterprise, assigning to it the menial task of subsidizing the imperfections of business instead of the bold task of promoting positive performance on behalf of the general good. I think labor will back this measure if it can be changed to provide a creative purpose, rather than a crutch, for the American economy.

4. Pursuit of our full employment objective involves another—political action. Labor is in politics for keeps. It is in politics to cope with a basic issue of our times—the issue of the private power of monopoly vs. the public power of the people. This is the question that arises out of labor's postwar experience with wages, prices, profits, employment and production. Shall we have private government of the economy or public government?

To come to grips with this issue we must concern ourselves about the exercise of public power. We do not intend that government autocrats shall substitute themselves for economic autocrats. We must get into the governing process. That is, we must get into politics. We? Not only labor, but all of the American people who live by their labor rather than by their property.

III

What does all this mean to agriculture? Back in the 'twenties labor's drive centered largely on a higher wage per hour, and for only a select few within the ranks of labor. That being so, the farmer's problem was remote. Cheap prices for food were desirable, no matter what they might mean to food producers.

This certainly is not labor's view today. Labor sees that the purpose of farm price supports is similar to its own purposes in collective bargaining. The farm program began during the depression at the same time as the organizing drive which brought labor unions their great increase in membership. And the purpose was the same—to provide human security against the onslaught of economic forces. And the opposition comes from the same quarter. The attack upon farm price supports, the demand that farm prices be left to unfettered supply and demand, the proposal that each farmer should decide in isolation how much acreage to till or livestock to feed, have come from the same financial and industrial sources that still hope to divide labor, to destroy its collective bargaining power and to drive it back to competitive wages.

Labor endorses farm price supports. It wants food as cheap as it can buy it, but not at the expense of sweatshop farming. This is not based on sentiment but on a recognition of common interest. Organized labor has little reason to be grateful to organized farmers. It has experienced a hostility from that quarter which could force a fatal rift between them were it not for the fact that so many organized workers were born on farms and so many more have family ties reaching back to those who work the land. They know farming is hard work and hazardous. And they have seen the farmer's principal crop, his sons and daughters, come to the factories to work and fight side by side with other workers to protect their rights as human beings against the inhumanities of the factory system.

But labor's most important support for the farm price support program is its determination to achieve steady full employment and production at good wages. For only full employment can assure good markets, and price supports are in peril if markets collapse. The security which the farm family wins through price supports is as vulnerable as the security which the worker's family wins through collective bargaining. A return of depression can destroy both. Even a continuation of the present "corrective adjustment" (as the business journals call it) with the labor market stabilized at some five or six million unemployed—threatens the programs of farmers and city workers. Curtailed production and employment is welcomed by big business precisely because it holds out the hope of cheaper labor and cheaper raw materials.

Success on the part of labor in achieving its goal of steady and expanding full employment means a great deal to agriculture. It means high and steady farm income. It means a genuine opportunity to practice the conservation which the nation needs. It means an abundance of the goods that relieve toil. It means better farm homes, good rural schools, and hospitals and clinics that are accessible to farm families. It provides the only sensible hope in sight that we shall ever begin to do something for that suppressed one-fourth to one-third of families on farms who are truly the forgotten families of our day.

Labor's full-employment goal means the same things for all of us. It promises the only possible solution for the restrictive and separationist policies which plague all our groups. For if we go back to chronic unemployment we shall go back to prohibitive tariffs. And if we do not import, we shall not export. So again we will seek salvation through scarcity. Labor will join up with employers to restrict output, and agriculture once again, as in the '30's, will try to get ahead by attempting to make farmers imitate monopoly, and with as little success.

But labor will not achieve its goal unless farmers share in the winning of it. Nor will the two together make headway unless they and other groups of people get into politics. For the issue facing labor and agriculture is not merely what the welfare of the one means to the welfare of the other. The issue, I repeat, is whether the American people will create a grass-roots political democracy through which they can participate and plan together, can estab-

lish the goals which they desire to achieve, and can carry out through their governments such public policies as they find necessary. If they default, they leave the outcome to government by private monopoly or to a bureaucracy manipulated by the powerful few, and there will be little to choose between the two.

Are these conclusions too bold? In these days of corroding hysteria and of professional withdrawal, the attempt I have made to extract meanings from history and to create goals out of experience may strike you as neither safe nor persuasive. Well, in that event I ask you, who has, if labor does not, a program to make meaningful the future of our people?

MARKETING RESEARCH UNDER THE RESEARCH AND MARKETING ACT

BERNARD JOY

Agricultural Research Administration

WHILE conception took place with the passage and signing of the Research and Marketing Act on August 14, 1946, birth of the program did not occur until almost a year later, July 30, 1947, when funds to carry out the Act were made available. Although some plans for the baby were developed during the period of pregnancy, the record of progress began just two years ago.

Just as a parent can record the progress in height and weight of a two-year old child, so we can record the growth in the appropriation from the original \$9,000,000 to the present \$19,000,000.

On the other hand, just as it is difficult for a psychologist to appraise the mental and social growth and potentialities of a two-year old, so likewise is it difficult to appraise the social and economic significance of a program so young.

Those of us on the staff that has provided nursing services for the youngster are naturally proud of his progress. Our appraisal may not be as objective as it should be, because our relationship with the child involves the love that is a natural outcome of intimate association. In inviting me to speak on this topic you have exposed yourselves to the same danger as when you encourage a parent to talk about his child.

Those of us involved in the administration of the program are proud of its development. We believe that the person chiefly responsible was exceptionally well qualified for his task. E. A. Meyer had a clear vision of the potentialities of the program and a skilful hand in getting hundreds of people to assist in its development. His ability to obtain and amalgamate the constructive thinking of leaders among producers, processors, and handlers of agricultural products is a significant administrative achievement. The development of a program involving coordinated effort of personnel in several federal agencies, in the Land Grant Colleges and State Departments of Agriculture, and in private industry is not only an achievement of which each participant can be proud, but an administrative accomplishment that establishes Woody Meyer as a leader who deserves our highest tribute.

We likewise believe that we are most fortunate to have P. V. Cardon, the able and experienced Agricultural Research Administrator, as the person who will carry forward as leader of the developing program.

The situation on August 1, 1947, was not a simple one. The Act left a great deal of latitude with regard to (1) what was to be done, (2) who should do it, and (3) how it should be done.

What should be done?

Title I, Section 9 of the Act provided for allotment of at least 72 percent of the funds appropriated to the State Experiment Stations on a formula basis. It provided that up to 25 percent be allotted to the States for cooperative regional research. Except for the provision that at least 20 percent of such funds should be used for "marketing research projects" discretion regarding the use of these funds is limited only by the broad language "research into the laws and principles underlying the basic problems of agriculture in its broadest aspects."

Sections 10(a) and 10(b) provide for research in utilization and research in cooperation with the states in fields other than utilization. In other words, almost any type of research—new uses of farm products, nutrition, prevention of waste, animal and plant breeding, housing, soil and water conservation—all could qualify, and the list could be much longer.

Title II provides for research, educational, and service work in marketing. Marketing is a broad field encompassing preparation of the product on the farm, grading, packaging, processing, freezing, storage, transportation, wholesaling, retailing, consumer preferences, foreign trade, costs and margins, and pricing practices. This list, too, could be lengthened greatly.

Who should do it?

The Act provides for utilization of Federal agencies, State Experiment Stations, State Extension Services, State Departments of Agriculture and Bureaus of Markets, and private organizations. It specifies state matching of funds for certain work and permits contracts with public or private organizations when they can carry out work "more effectively, more rapidly, or at less cost than if performed by the Department of Agriculture."

How should it be done?

Developing organization, policies, procedures and staff is not simple when it involves agreements with a variety of Federal agencies, cooperative relationships with several agencies in each of 48 states, and contractual agreements with private agencies.

The Research and Marketing Act has at times been considered to be a Marketing Research Act. This is unfortunate, as legal provisions require that only about five percent of the funds be spent on marketing research projects, if utilization research is not classified as marketing research. Under Title I, Section 9, 80 percent can be spent on other fields. Title I, Section 10(a) funds are to be spent on utilization research, and Title I, Section 10(b) funds on research other than utilization. Title II funds could be spent wholly on marketing services and educational work. Of course, that was not the intent of the Congress, and a large part has been spent on marketing research.

The desirable flexibility in the Act did pose the administrative problem of deciding how much of the total funds appropriated should be spent on marketing research? How much on research in other than marketing? How much on service and educational work in marketing? The decision on these broad questions was not reached by one person or at one time. Fifty-one experiment station directors acting individually have had major responsibility for making the decision in regard to \$3,600,000 of the appropriation for the fiscal year 1950. A committee of nine experiment station directors had major responsibility for making this decision in regard to \$1,250,000. The results of their selection of projects is that approximately \$2,000,000 of Title I, Section 9 funds will be spent on marketing research projects in 1950 and this will be supplemented by about \$1,500,000 of state matching funds.

Some people classify all research in utilization of farm products as marketing research. Obviously development of new or improved uses does increase market outlets. However, almost all of this research is technological rather than economic. As it is covered by a separate section, 10(a), in the Research and Marketing Act, the amount is annually fixed by Congress. For the fiscal year 1950 it is \$5,000,000.

Title I, Section 10(b) is for cooperative research with State Experiment Stations in fields other than utilization. These funds can be used for marketing research and most of the Federal cooperation in conducting regional marketing research projects under

Section 9b3, has been financed from 10(b) funds. The amount in fiscal year 1950 for such cooperation is approximately \$350,000. As I expect the speakers that follow me to discuss the regional marketing research program, I will confine the remainder of my discussion to the marketing section of the Act known as Title II.

The appropriation for Title II for the fiscal year 1948 was \$2,000,000 instead of the \$2,500,000 authorized for the first year. In 1949 it was \$4,750,000 or 95 percent of the second year authorization. However, \$6,000,000 for 1950 for Title II is 120 percent of the second year authorization.

Title II funds are to be spent for marketing work. This can be either research or service and educational work. One of the difficult administrative decisions has been how to divide the funds between the three fields. It is complicated by the fact that insofar as possible the service and educational work in marketing is to be carried out through state agencies that must match Federal funds on a 50-50 basis.

The actual decision regarding the amount of funds going to State Departments of Agriculture and Bureaus of Markets for service work and to State Extension Services for educational work has been made largely in the states. To qualify for matching the state monies must be in addition to those available for marketing work when the Act was passed. The amounts of such new money that the States have had for marketing work has largely determined the amount of Title II funds used for educational and service work in the States. The Agricultural Research Policy Committee recommended that funds made available by the States be matched if their work proposals were sound and provided the amounts to individual states was not disproportionate to the total. With minor exceptions the amounts of money the states have had available have been matched and the portion of Title II funds going to them has approximated 20 percent of the total appropriation for Title II. In the fiscal year 1950 approximately \$1,200,000 of Title II funds and an equal amount of state matching funds will be expended on new service and educational work in the states.

Not all the remaining Title II funds are expended on marketing research as contrasted with marketing service work. Federal agencies may do service work and contracts may be executed with public or private agencies for service work. However, decisions in regard to such additional service work have been made on a project by project basis weighing the value of proposed service projects against

the value of proposed research projects. Some projects are difficult to classify as research or service, but based on a somewhat arbitrary classification the 1950 expenditure on Federal agency and contract projects for marketing service work will be approximately \$950,000.

The basic unit for consideration of what work should be done in the field of marketing research, how it should be done and by whom it should be done has been the work project. In 1950 there will be 95 marketing research work projects supported by Title II funds. The expenditure for them will be approximately \$3,850,000. The total Research and Marketing Act funds spent on marketing will be about \$6,200,000. With about \$1,800,000 of new state funds the total program is about \$8,000,000 greater in 1949-50 than in 1946-47.

Administration is sometimes divided into six major functions:

- (1) Developing policies
- (2) Developing plans of work and authorizing expenditures of funds to carry them out
- (3) Development of an organization and assignment of responsibilities
- (4) Selection, training, supervision, and control of personnel
- (5) Coordination of effort
- (6) Reporting accomplishment

A large portion of the administrative functions related to marketing research on Research and Marketing Act funds have been decentralized. Only functions 1, 2 and 5 have been the responsibility of the Administrator and his staff. They have worked on policy, plans of work, coordination, and budget justification.

The plans of work have all provided for the actual conduct of the research by agencies of the Department, State Experiment Stations and private research organizations. The administrator of the agency conducting the research has been responsible for the development of an organization, personnel and reporting the results of research work.

Two of the most important items of policy were indicated by the Congress in the Act itself. They are: (1) Use of facilities of existing agencies and organizations for the conduct of the work, and (2) Use of committees representing producers, industry, government and science to make recommendations relative to work to be done, and to assist in obtaining necessary cooperation to carry it out.

Plans of work have been developed within this framework. During the past two years final decision on what work is done and

what work is postponed has been made by the Administrator in conference with eight assistants. Before this group is a long list of work projects each with a price tag on it. The project titles are supported by a research outline which tells:

1. The problem and need for the work
2. The objective to be reached
3. How the work would be done
4. Who will do the work

Also before this group is the amount of money that is or may be available. This figure has always been far below the total of the price tags on the individual proposals. The problem is to reduce the list either by eliminating items or cutting the price tags until the total equals the money available.

When the group assembles it has some criteria in mind that are applied to each proposal. As these criteria have not been formally stated, I will express them in my own words.

1. Does the work qualify under the provisions of the Act?
2. Is the work part of a broad field that should receive emphasis?
3. How important is the problem to be solved in the minds of producers, industry and scientists as indicated by the priority given to it by advisory committees?
4. What is the probability of the proposed research being conducted successfully in light of the personnel and facilities available? Is the group proposing the work the one best qualified to do the job?
5. How does the particular research proposed fit together with work already completed or under way and with other work proposed?
6. Considering the first five criteria, how high is the cost in terms of probable results?

Many months of work have preceded the conference session at which some work projects are selected and others rejected. This work has consisted of delineation of the criteria and study of the individual work proposals.

The individual proposal has been checked against the provisions of the Act and the administrative policies set up pursuant to its provisions. Frankly one of the most perplexing questions is "What is marketing?" Text book definitions are of little help when you are faced with a proposal to reduce loss of a processed product during storage and develop methods for preventing the loss when the presumption that loss is caused by an organism that infected, but could not be detected in the raw product before it was harvested, is just as likely as the presumption that the loss is caused by conditions to which the product was exposed in processing, transportation or storage.

Determination of the broad fields that should receive emphasis is one of the major contributions of the 11-man Agricultural Research Policy Committee set up by Congress in Title III of the Act. This Committee meets quarterly. They point out the need for consideration of broad policies such as a desirable balance between livestock numbers and human population. Congressional hearings are also rich in indications of broad fields needing emphasis such as recurring questions on why the price spread between the farmer and the consumer is so great.

Establishment of the relative importance of various problems in particular fields has been the chief purpose of the meetings of 22 commodity and functional advisory committees. Before the committees meet a representative group of department scientists meet and develop a list of problems for the committee to consider. The advisory committee reviews the progress of work under way, adds problems to the list and arranges the list according to relative importance of problems.

The advisory committee recommendations are a major consideration in the selection of problems on which the agencies develop research proposals. However, the priorities suggested by the research agencies when they submit proposals may vary from those of the committees in light of the availability of personnel, facilities and "know how." Work basic to the solution of some problems may be barely started while the solution of other problems may involve the application of well-established techniques to an additional commodity or function. The plan of work and allocation of funds that has resulted from this process is summarized in the following table showing the budget for Title II funds under five major and 22 minor classifications

TITLE II. MARKETING RESEARCH AND SERVICES

	1948 Allotment	1949 Allotment	1950 Budgeted
<i>I. Basic data and information</i>			
a. Reports on supplies, prices and movement of farm products.	\$ 162,750	\$ 229,700	\$ 238,000
b. Improving market news and other market information services.	63,560	150,800	173,000
c. Promoting greater use of market information through State educational and service agencies.	16,000	156,000	175,000
Total, Financial Project I	\$ 242,310	\$ 536,500	\$ 586,000

TITLE II. MARKETING RESEARCH AND SERVICES (Continued)

	1948 Allotment	1949 Allotment	1950 Budgeted
II. <i>Expansion of outlets for farm products</i>			
a. Development of foreign outlets.	\$ 63,800	\$ 161,000	\$ 200,000
b. Exploring opportunities for expanding domestic markets.	38,840	158,700	193,000
c. Determining consumer preferences.	95,200	167,400	206,000
d. Consumer education.	43,000	86,000	125,000
e. State service programs to expand market outlets.	265,000	374,200	425,000
f. Analyses of supply, demand, and consumption.	69,850	139,100	149,000
Total, Financial Project II	\$ 575,190	\$1,086,400	\$1,298,000
III. <i>Marketing services, costs and margins</i>			
a. Analyses of marketing services.	\$ 24,200	\$ 70,900	\$ 149,000
b. Studies of pricing practices	21,000	41,300	43,000
c. Measurement of costs and margins.	41,000	318,800	549,000
Total, Financial Project III	\$ 86,200	\$ 431,000	\$ 741,000
IV. <i>Improvement in preparation and handling of farm products</i>			
a. Development and improvement of grades and standards.	\$ 174,200	\$ 496,300	\$ 483,000
b. Developing improved containers and methods of packaging.	50,200	125,000	140,000
c. Improving transportation services and equipment	14,250	51,700	120,000
d. Economic studies of new and improved processing methods.	58,650	140,000	255,000
e. Improved storage and conditioning of farm products	95,900	322,800	422,000
f. Quality preservation in marketing channels.	64,500	271,600	255,000
Total, Financial Project IV	\$ 457,700	\$1,407,400	\$1,675,000
V. <i>Evaluation and improvement of marketing system</i>			
a. Improvement in physical plant.	\$ 160,800	\$ 252,600	\$ 263,000
b. Increasing efficiency of merchandising agricultural products.	106,800	246,200	315,000
c. Evaluation of market organization.	132,000	211,100	304,000
d. Improving marketing methods and efficiency through State educational and service programs.	166,000	443,000	675,000
Total, Financial Project V	\$ 565,000	\$1,152,900	\$1,562,000
Over-all Administration	73,000	135,800	138,000
TOTAL, TITLE II	\$2,000,000	\$4,750,000	\$6,000,000

ADMINISTERING MARKET RESEARCH—WESTERN PROBLEMS

D. B. DeLoach

Bureau of Agricultural Economics

VARIOUS comments have been made about the general conditions of western regional market research. Opulence, infancy, malnutrition, family troubles over finances, and cerebrospinal ossification are attributed to the program. Obviously there are certain basic difficulties or your program committee would not have chosen to devote so much time to the subject of "Administering Market Research."

There are basic problems that have developed in the administration and activation of a large-scale regional market research program. They are centered mainly around specific points, namely:

1. The suitability and value of the market research projects regionally and to the state.
2. The inexperience of the existing market research staffs.
3. The feasibility of expanding the market research staff to handle projects of short duration.
4. The allocation of staff time between research and teaching.
5. The manner and extent of state participation in regional research programs.
6. The extent of industry and agriculture cooperation with regional market research agencies.
7. The lack of definiteness regarding the meaning of regional market research.
8. The time required to administer the program.

Suitability and Value

If viewed from the standpoint of research results only, the first two years of western regional research was almost a total loss. On the other hand, the eleven western states did effect a working mechanism through which regional research could be done provided the states develop their research staffs of trained people to carry through their assignments. This latter qualification raises several issues.

The practice of dividing funds among several states to do research on a specific problem implies an obligation to do productive research. This is true even though the funds made available to the station from state and RMA sources are barely enough to meet traveling expenses to the scheduled meetings of the technical com-

mittees. As a matter of good administration, states are going to be forced to ask what economic problems are of regional significance and lend themselves to active participation with several research agencies in the region.

I have had a reasonably close contact with developments in four WM projects. Experience and well defined regional research administrative procedures are lacking. Local pride and the fear of criticism for inattention to local problems make necessary the participation of each state in each of several projects. Frequently no results of consequence are obtained that would not have been obtained through non-participation. The added value of the research to the state is often slight. It is possible that some of this local emphasis will be relieved when regional research publications become better known.

Inexperience of Existing Market Research Staffs

Specific qualifications are necessary if a researcher is to accomplish worth-while results. Competence comes partly from training, partly from experience, and partly from an aptitude for the particular task. Some of the western states are still having a difficult time locating qualified researchers to fill existing vacancies, a condition arising partly from the lack of security of tenure. Others have filled all available positions but have had to choose men insufficiently trained and without any real interest or experience in marketing or markets. Under such conditions the administrator must have sufficient time to plan and to supervise the research program or the entire research operation is characterized by inefficiency and waste. There is reason to believe that most of our western stations have had to face this problem frequently. Inasmuch as experiment station market research administrators have had several new hurdles since 1946, their time must be spread thinly over each of many problems. In one sense, they have been forced until recently to accept the slogan of a prominent farm combine manufacturer, "Once Over and It's All Over."

Feasibility of Expanding the Research Staff

Good management practices in the field of economic research should follow good management practices generally, e.g., the size of labor force should be related to the volume of immediate and potential work. This type of managerial procedure presupposes

the existence of a market research program associated with the needs of industry and agriculture, but it in no sense excludes a core of basic research that might be called "tool building."

Several state agricultural experiment stations have expanded their market research staffs at a phenomenal rate since 1946. Part of this expansion has come as a result of a program begun under state appropriations for market research, but the real stimulus came from funds appropriated for section 9b3 of the RMA. Perhaps it will be shocking to some of you for me to state publicly that several western states and federal agencies (and I know of states in other sections of the country) have been embarrassed with too much money for market research, considering their plans and personnel. There are two reasons for this. The first is lack of time to develop a program and organize a competent research staff to carry through the program. The second comes from inability of research groups to obtain full cooperation from market agencies. Time is helping to correct the first condition because worth-while plans for research projects are emerging for 1950-51, along with better qualified and more seasoned research workers. The second condition is not improving. Marketing agencies are scrutinizing closely requests for confidential records, and are consistently raising the basic question regarding benefits to come from such research. Some business leaders who have been "surveyed" regularly without seeing any results ask frankly whether this is just another state or federal statistics-gathering scheme, the possible use of such statistics being only remotely associated with improving the efficiency of the market processes.

If any significance is to be attached to the foregoing conditions, one might assume that agricultural marketing agencies are much less interested in carrying on the type of regional market research done under RMA since 1947 than is commonly supposed. It is very easy for business people to point out the inconsistency of research designed to improve marketing efficiency while other state and federally supported programs are designed to maintain the status quo. All these factors taken together cause any good administrator to appraise the temporary and permanent personnel needs very carefully. If regional research is continued on the present scale, will the program be modified to require a "floating" group of regional researchers? If the program is not retained, do state civil service and retirement regulations make it inadvisable

to expand the research staffs? Each state must meet these issues in terms of its best judgment as to the basic market research needs of its people and the willingness of the people to finance adequately a worth-while program of market research.

Allocation of Staff Time Between Research and Teaching

There is no denying that western regional market research plans were badly disrupted for two years because the teaching load assigned to many research workers left little time for research. One glaring example is that of the researcher assigned to three research projects in addition to a teaching schedule requiring him to hold classes five days each week. This condition has not been corrected entirely. Conditions within the region are so much better now that harsh criticism for most of the eleven states is unwarranted. It will not be easy for some of the smaller states to completely solve this riddle of minimizing interference of teaching duties with research assignments. The nature of a teaching assignment is such that there is a minimum time requirement involved regardless of the quality of the work. The nature of man is such that there is a maximum time limit on the number of hours he can or will work each day. We have spent ten years in agricultural economics at Oregon State College trying to develop our research and teaching staff to the point where conflicts between the two assignments could be kept to a minimum. The results follow:

Number of staff	Assignment	
	Research	Teaching
	<i>Percent</i>	<i>Percent</i>
4	100	—
1	81	19
3	75	25
2	67	33
4	50	50
1	30	70

The foregoing allocation of time might not look good to other colleges, but it certainly is better than anything we have had previously. Furthermore, we have been able to arrange our teaching program in a manner to permit the teaching assignment to be completed before the research is undertaken. This is a very im-

portant consideration in a small school, because we have a limited number of graduate students to use on a market research program.

State Participation in Regional Market Research

It is difficult to establish any firm rule as to the number of regional market research projects in which a state should participate. The diversification and importance of agricultural activities and the characteristics of the problems should be the determinants. But they cannot be the sole determinants if efficiency is taken into consideration. For example, Oregon has such a wide diversification of crops and marketing problems that a selection based on the urgency of the problem has been the means by which most of our projects were begun. This basis for choosing fields of market research when funds are insufficient to go around may be lacking in many respects, but I cannot see any other practical procedure, all factors considered.

Certain of the eleven western states have established industry advisory committees to work with the stations in developing a market research program. Whether this device will prove satisfactory remains to be seen. The implications are quite clear; in fact, too clear to be entirely comforting to true research workers. It seems that the insistence of commodity groups that their particular problem deserves immediate attention has caused research administrators to divide funds among several projects to a point where no one project is adequately financed or staffed. The foregoing statement might appear inconsistent with my previous remark that research workers are not receiving the complete assistance of agricultural marketing agencies. This is not the case. When a commodity group advises that certain market research would be helpful and it would be interested in having it done with state or federal funds, there is no implication that the members of that industry are obligated to supply the information needed to make the inquiry successful. Some few months ago I sat through a meeting of one of the national commodity advisory groups. The commodity has been subsidized heavily for several years, yet there was very little interest in a study of the economics of marketing the commodity. There was no reluctance, however, to support heartily a proposal to use a substantial amount of research funds for buildings and physical equipment. One could easily raise the question at this point as to whether market research in state and federal agencies

can begin to rely more on good research procedure as a means of maintaining support.

There may be considerable disagreement as to the emphasis each of you will place on the conditions I have mentioned. Regardless of this, your decisions as to the number of research projects carried by your departments will have to be affected greatly by these forces.

Industry and Agriculture Cooperation with Research Agencies

Western regional market research workers have been very successful in obtaining cooperation from marketing agencies where the information needed related to handling practices and market channels. Reasonable success occurs in obtaining selling prices. The success curve starts downward rapidly when questions are asked concerning costs and the components of costs, and the location of market outlets. This type of questioning gets too closely to the only competitive aspect of many businesses. Cost information is also guarded closely by some types of businesses for fear it will be used to their disadvantage in wage negotiations with labor unions. In other instances the kind of cost data sought by researchers is not available and could not be made available without undue expense to the firm answering the questions.

A substantial part of the difficulty of obtaining factual data from marketing agencies stems from the inability of researchers to explain what they want, why they want it, and how such information will be used if it is made available. The inexperience of researchers in a particular field becomes an unusual liability in market research work. Too many researchers are interested solely in assembling a mass of statistics. Market men soon lose patience with a research man who is unable to ask intelligent questions about an industry on which he will later pass expert judgment. This situation has arisen so frequently that one wonders whether the training given students in agricultural economics is alone adequate preparation for market research.

Lack of Definiteness Regarding the Meaning of Regional Market Research

A cursory examination of the eight western regional market research projects leaves one with considerable doubt as to what constitutes regional research. I have tried to be broad-minded on

the subject. On several occasions, however, I have had to defend the actions of my fellow workers in Oregon and neighboring states. The fact that my arguments were accepted left me with the impression that the persons who accepted them were very generous in many instances. Two regional projects can be used to illustrate my point.

I believe the western dairy marketing project is a very good illustration of a regional research undertaking. As nearly as possible the principal states are working on different aspects of the problem of marketing milk. Some of the activities are confined to inquiries into local market problems, but in each instance, these problems are of significance far beyond the immediate area. To an administrator who is unfamiliar with the dairy industry, one has some difficulty explaining the regional aspects of the work in progress. On the other hand, the western group has had no difficulty explaining the regional characteristics of the turkey marketing studies which were brought to a close in June, 1949. The project looked perfect on paper, but in terms of the work done the regional features assume less importance than they should. I wish to add, however, that this very fact was one of the basic reasons for the development of a thoroughly coordinated program in marketing poultry and poultry products in the western region.

Time Required to Administer the Program

Considerable criticism has been directed toward the regional market research program because of the time required to plan and execute the work in cooperation with other states and federal agencies. There appears to be a reasonable justification for this complaint. Approximately 25 percent of the regional market research funds allocated to Oregon in 1948-49 was spent for administration as a result of direct participation in the work of the regional technical committees. If indirect administrative activities were charged against the projects in proportion to the actual time requirements, I do not believe I would be far afield to estimate the cost at approximately 50 percent of the RMA funds made available to Oregon for regional market research. My observation of the administrative activities of the Bureau of Agricultural Economics relating to the use of RMA 10b funds would indicate very heavy expenditures for administrative purposes. The Bureau's problem, like that of the states, arose from an attempt to spread its funds

thinly in all regional market research work. Conditions similar to those I have mentioned exist in a sufficient number of states to warrant a very close study of the basic causes and the possible implications of this situation.

Present Trends

Up to this point I have reported rather gloomily on the regional market research done in 1947 and 1948, recognizing a substantial improvement in the outlook for the current fiscal year. More improvement can be expected for 1950-51. Real progress has been made toward a definitely regional program for milk, poultry, and deciduous fruits. Further progress can be expected on other commodities if these initial steps are approved by the Committee of Nine. But in no case can the western region assume that it has solved its major problems until:

1. It has clarified and simplified the objectives of the regional market research program, and
2. Obtained from the Research and Marketing Administration and the Office of Experiment Stations a consistent, clear-cut, and simple set of administrative procedures that will reduce greatly the administrative confusion connected with the program.

ADMINISTERING MARKET RESEARCH— NORTHERN PROBLEMS

RAYMOND J. PENN
University of Wisconsin

YOU must recognize that my remarks on this subject will be based largely on a few months' experience in one agricultural economics department in one college of agriculture. When Mr. Wells asked me to prepare this paper he indicated an interest in the opinion of one "who has been more or less suddenly forced into the marketing field. . . ." This paper does not necessarily represent the policies of either the Wisconsin Experiment Station or the Agricultural Economics Department.

There is not much question what we are concerned about. It is the Research and Marketing Act of 1946 and the administrative problems growing out of a greatly expanded program of market research. I plan to confine this paper to those parts of the Act which are of most concern to an Agricultural Economics Department in a State Experiment Station.

Research funds may be made available to Experiment Stations under several sections of the Act. Stations may submit marketing projects under Title II, provided new money is available for matching purposes. Some Stations have Title II projects. However, I suspect our experience is rather common. When the Act was first passed our department developed quite a number of marketing research projects to be submitted under Title II. None of the projects were approved until the spring of 1949 when one small research project was activated. New money for matching purposes has been very limited in our Station. However, our 1949 Legislature appropriated some new funds for marketing. To date, then, we have made very limited use of Title II research funds. We may use it more in the future, particularly since a five-man committee of Station directors has been established through which Title II marketing research projects can be channeled.

Another source of research funds available to Experiment Stations is the allotment to U.S.D.A. The U.S.D.A. may contract to have research done by any public or private research agency (Sec. 10a of Title I and Title II). Our department has submitted one proposal of this type which has not as yet been approved. I under-

stand only a few of these contracts have been consummated with Experiment Stations.

My experience with Title II—the strictly marketing portion of the Research and Marketing Act—has been very limited and we have practically no experience with the contract arrangements. Hence, the remainder of my paper will be devoted to that portion of the Act which authorizes appropriations of research funds to the Experiment Stations, namely, Title I, Section 9. This section contains provisions for state research (Sec. 9b1 and 9b2) and regional research (Sec. 9b3).

State Research Under RMA

The funds allocated directly to the Experiment Stations may be used for almost any kind of agricultural research. However, at least 21 percent of these funds must be spent on marketing. The availability of the remaining 79 percent is contingent upon the full expenditure for marketing research. Research supported by 9b1 and 9b2 funds is done under very nearly the same administrative arrangements as have been used by the Stations for many years on all federal grant research. The essential difference is that RMA project proposals must be submitted six months to a year prior to the time when funds will be available for the research. According to a recent announcement from the Office of Experiment Stations all Sec. 9 projects for 1950–51 must be in the Office of Experiment Stations September 1, 1949. The projects will then be submitted to the Bureau of the Budget by September 15, 1949.¹ These proposals will be before Congress when the 1950–51 appropriation is made. It is my understanding that this makes it necessary for the Experiment Stations to use the 1950–51 appropriations only for the projects before Congress at the time of appropriation.

The Agricultural Economics Department at Wisconsin is participating in nine marketing research projects supported, in part, by 9b1 and 9b2 funds. Four of these projects are very similar to and support the regional projects of which I will have more to say later. I said we participated in nine marketing projects because two of them are being conducted in cooperation with our production departments.

¹ *Time Schedule for the Preparation of Cooperative Regional Projects and Budgets*, Office of Experiment Stations, May 5, 1949 (includes schedule for 9b1 and 9b2 projects).

These are some of the problems we face in using 9b1 and 9b2 funds, not necessarily in the order of importance.

1. If we do not utilize at least 21 percent of the 9b1 and 9b2 allotments for marketing the Station will lose funds available for non-marketing research. Obviously, we are under pressure to utilize the marketing funds. If we do not expand the marketing research in the agricultural economics departments we may expect to see an expansion of marketing research in the production departments. Of course, if we do develop a number of new marketing projects we increase our personnel and our space needs which brings criticism from our associates in other departments.

2. The time schedule for submitting RMA research projects does not fit my idea of the way research is done in social sciences. Particularly is this true if the Experiment Station Director cannot shift the funds from one project to another or change the projects. You will recall that the 1950-51 projects are to be in the Office of Experiment Stations, Washington, September 1, 1949. This means the research person must propose the project just about one year before the research begins. I recognize it may have been desirable to demonstrate to Congress the scope of the new research in order to receive the appropriations. The person doing the research, however, is often seriously handicapped if he is expected to work on projects drawn up a year before he starts his research.

A good research program, particularly one that is rapidly expanding, should permit the research person considerable flexibility. The social science researcher should have a plan of work which is in a process of continuous change. He tries an approach which may be fruitless and he should drop it. Or it may open up an entire area that was not before considered significant. For the most part, the usual Experiment Station procedure offers opportunity for flexibility. The director is close to the research staff and he knows the characteristics of most of the research personnel. I am confident many directors approve projects more on their confidence in a researcher's ability to do a good job than on what is said in a project proposal.

It is difficult if not impossible for the research person to prepare a meaningful project statement a year before the research starts. His attempts have resulted in much wasted effort. Most of us have prepared many more project statements for RMA than have been approved. I have had the feeling we were writing them in the dark.

We did not know the amount of appropriations which would be available and were writing projects for personnel not yet on the staff. Certainly staff working on a project should participate in the formulation of the research problems.

I think the time schedule for RMA projects should be re-examined. Why can't the 9b1 and 9b2 funds be allocated to the Experiment Stations each year as other federal research funds? We don't have to write projects a year in advance to use Hatch or Purnell Act funds.

We may well be at a point in our research where we will have to take a new look at just what a project statement is. I think administrators and researchers alike have placed too much reliance in the project statement. It is considered to be a device to control and direct research and at the same time to be a research plan of work. I am confident we would be more realistic if we would develop some sort of a research agreement which would be recognized as nothing more than an agreement to proceed on a general line of work. A series of work plans and summaries of results could be used to give the administrator whatever control is necessary.

3. A marketing research program called for by RMA requires personnel. Nearly all the Experiment Stations have or could make one or two positions available in marketing. Certainly we have done our share to raise the salary of marketing research personnel. I believe the best solution to the personnel problem is to bring more general agricultural economists and even economists into the marketing research program, particularly those trained in prices.

In our marketing research program we are helped a good deal by graduate students. Some of our more promising graduate students who have completed all requirements for their degrees, except the thesis, have been employed on full-time research for the duration of a specific marketing project. We have conducted several research projects in this manner which we think have made significant contributions both in research results and in better trained graduates. Some of these students could not have completed their graduate training without such an opportunity. We realize the fact that these young men do not have much tenure and that we are slowing down some the rate at which our graduates become available for permanent positions.

4. I suspect the most critical problem most of us face as a result of the RMA is that of defining significant and manageable research

problems in a line of work that is expanding so rapidly. The danger, of course, is that it is easiest to do more research on the same problems. We can always follow more agricultural products through the market and describe the functions, services, costs, margins, shrinkage, etc. I do not propose to set down a list of good and bad marketing projects. But I would be a little less concerned if more of our marketing research was designed to help improve our marketing system and more of our effort was directed at such areas as pricing arrangements, financing, and consumers' preferences.

The effectiveness of the research program of any organization will rest with the staff—not the administration. The marketing staff member who can locate real problems, get some information important to their solution, and see that results are made available to persons or groups who are making decisions, is indeed a valuable person. We must work out democratic procedures for administering research. Attempts in this direction are being made at a few colleges and universities and I know one or two men in the U.S.D.A. who understand the idea. However, the idea that administration can be democratic is completely foreign to most of our thinking.

5. The rapid expansion of marketing research in most of our departments has had no counterpart in the other lines of research we are engaged in. It is quite natural for administrators to think the agricultural economics departments are doing well, and, hence, to use the 9b1 and 9b2 non-marketing funds in other departments. I suspect some of the responsibility for this situation rests with the staff. Actually non-marketing research in agricultural economics is authorized with 9b1 and 2 funds. The non-marketing staff have not been familiar with the Act and hence have not submitted new projects in the time pattern required by RMA.

Regional Research (Title I, 9b3)

Anyone from the North Central Region writing on the RMA should have something to say on regional research. For over 10 years now the North Central Region has had at least two very active regional committees engaged in research activities—The North Central Regional Livestock Marketing Committee and the North Central Regional Land Tenure Committee. Both of these committees have received active support from BAE, U.S.D.A. The livestock marketing committee has had one BAE person available

to coordinate the research.² The land tenure committee has had a number of BAE personnel work with it on specific projects. And, of course, the Farm Foundation has given the tenure committee continuous support. The Farm Foundation was instrumental in arranging for the first exploratory regional conference at Davenport, Iowa in 1938. Since that time the Foundation has paid, among other things, the travel expense of state technicians to attend at least two regional meetings a year. Regional committees came along rapidly in the North Central Region. The Poultry and Egg Marketing Committee was formed in 1940 and the Farm Structures Committee in 1944. Now we have eight regional committees concerned with agricultural economics research, six in marketing.³ Experiment Stations in the north central region have published 14 regional bulletins, seven on land tenure, four on marketing, and three on farm structures. The success of the regional committees on livestock marketing and tenure in the North Central Region was one of the major reasons Congress included provisions for regional research by Experiment Stations in the RMA.

In spite of this background of experience, I think regional research is the part of the RMA most difficult for the Experiment Stations. Let me illustrate again with our department. Our department participates in seven regional projects supported by 9b3 funds. Six are marketing and one is soil conservation. Seven of our senior staff are members of regional committees. One is chairman of his committee and chairman of the executive committee. Two others are members of their executive committees, one as secretary. Four other senior staff members serve with the regional committees in one capacity or another. This is a total of 11 senior staff members. As a minimum a member of a regional committee should spend several days once or twice a year attending the meetings. I would think he should spend some time preparing for the meeting and some time after the meeting carrying forward the program and decisions of the committee. The executive committee, made up of three or four members, is usually given the assignment of developing the project, recommending budgets, coordinating the research,

² Bjorka, Knute, "Regional Research in Agricultural Marketing," *This JOURNAL*, February, 1945, pp. 121-137, Vol. XXVII, No. 1

³ Cereal Marketing, Potato Marketing, Poultry and Egg Marketing, Livestock Marketing, Dairy Marketing, Fruit and Vegetable Marketing, Land Tenure, and Farm Management.

and editing the results. Major decisions are cleared with all state representatives. Members of these executive committees have quite a job. Decisions they must make are hard to make by correspondence. Hence, frequent out-of-state travel is necessary. Now for all six regional marketing projects our department will receive in 1949-50 about \$5,000 in 9b3 funds. This figure does not include regional funds (9b3) deposited with our Station for use of the regional "coordinators." You may say that it looks as though a small amount of regional money, acting as a catalyst, has stirred up a lot of activity at Wisconsin. The regional meetings have, I think, served as a stimulus to our research. On the other hand, most of the regional projects to date have not been enthusiastically supported by our staff if the amount of research done on the problem above the minimum regional requirements is an indication. I must say, however, that our department is planning to put about \$15,000 into research as a part of one regional project.

Although I am not familiar with the activities of our Station directors it seems to me they must be putting in relatively more time on regional research than on any other research program. One director is responsible for each regional committee and some directors have been assigned to several regional groups.⁴ The North Central Directors are meeting this week and I am told a considerable portion of their meeting will be devoted to regional research—projects, budgets, and allotments.

Regional research under the RMA has raised many of the same problems described in the previous section on state research (9b1 and 2). But, in addition, regional research has required relatively large amounts of time—both by staff members and administrators. Bookkeeping is excessive and project arrangements are complicated.

The real question before us is how to preserve the good features of regional research and at the same time reduce cost in personnel and money. We may find some of the RMA rules actually hinder work on regional problems.

I am in complete agreement with the logic behind the development of regional research in the RMA. The rules governing research workers in state Stations tended to limit their activities to the

⁴ *Definitions of terms and functions related to the organization and administration of Coop. Reg. projects . . . RMA. Memo. prepared by "Committee of Nine," Office of Exp. Stations, U.S.D.A., Aug. 1948.*

state. In many states technicians found it difficult if not impossible to travel outside the state. Many of the problems, particularly in social science, were common to several states and in some instances both research and improvement of the situation required the cooperative action of two or more states. Our North Central Regional Committee and subsequently regional research under the RMA were attempts to get research personnel from several states to work together on their common problems.

Generalizations are hard to make and often become meaningless. Yet here are some of the things I think Experiment Station personnel can accomplish by regional activity.

1. The competence of technicians will be improved. Technicians from several states working on similar problems will have an opportunity to exchange ideas and techniques.

2. Regional groups of technicians may bring valuable evidence to bear on regional problems without doing additional research. Previous research in the Stations can often be made the basis for important judgments on regional problems.

3. Regional groups can plan and conduct research together. I think there are three quite different types of research which can be carried on. One is in the nature of a regional census. This involves uniform schedules and the collection of similar data in each state. The second is a type of division of labor. Many problems are common to several states. If one state is doing research on one such problem then there is no need for additional work at another state. The third is research on a regional problem which will require regional judgment and regional action. This, I submit, should be the most important objective of regional research.

To date, however, very little of our regional research under the RMA has been directed to answering questions that must be answered as a region. There is some reason in this situation. A large segment of our devices available to do something about a given problem centers around our federal, state and local units of government.

I have described some of the regional activities we can and should carry on. Now let us return to the question of how to improve both the administration and the usefulness of regional research. As I have tried to point out the administrative machinery is costly in time and money. As yet the regional research has not been on regional problems, although there are some indications of

improvement. I am satisfied we should make some major changes in the rules. Here are my suggestions.

1. A series of regional agreements should be encouraged which spell out a general line of work. Funds should be allotted to these projects sufficient for the travel of technicians to regional conferences. This type of agreement should receive first priority in 9b3 allotments. The funds should be kept in a lump sum in the Station whose director is the advisor of the regional committee. This suggestion is based on my belief that most of the more desirable regional activities can be carried forward with existing sources of funds, provided rather regular regional meetings of technicians are possible.

2. If more specific plans of work are forthcoming for regional research 9b3 funds may be used in their support. These research plans should be carefully appraised to make sure the work cannot be done by other means. Certainly the plans should not have to be made a year before the research starts. There should be no attempt to use up a definite amount of money.

3. My third suggestion is that the full 25 percent of Sec. 9 funds need not be used for regional projects. If the research people do not develop enough regional research projects to use all of the funds the remainder will be distributed to the Experiment Stations under Section 9b1 and 9b2.

If we could follow the procedure I have suggested we would separate the funds used for the support of regional meetings of technicians and the funds used to do regional research. Combination of these two purposes has, I think, led to ill considered projects, especially where a definite fund has been set up and we try to use all of it.

DISCUSSION

M. T. BUCHANAN

State College of Washington

In my discussion of this topic I want to arrive at three major conclusions: (1) There is still a lot more to administering market research than is encompassed in various RMA funds and procedures (although properly the program committee and the participants have singled these out as the principal problems); (2) RMA funds are acceptable and can be utilized to advantage no matter what strings are attached; and (3) Committees are fine—in their place.

RMA sources of funds for marketing research were described by Dr. Joy. Leaving out the funds for utilization research, economists have a major interest in \$700,000 of 9b1 and 2 funds; \$371,050 of 9b3 funds, \$350,000 of 10b funds and \$3,800,000 of Title II funds. We are all glad to have these extra funds. Their proper utilization presents many challenges as has been pointed out.

We now have available in the Agricultural Experiment Stations a total of about 1.3 millions of dollars of relatively flexible funds as compared with slightly less than one million of 9b3, Title II and matching funds that might be classified as relatively inflexible in administrative procedures and use because of the unique problems associated with these fund sources.

Both of these sets of figures need some qualification—the flexible category by pointing out that considerable 9b1 and 2 and non-federal funds are tied up on regional or cooperative projects—and the inflexible by adding thereto some 10b funds allotted to cooperating federal agencies.

Nevertheless, at the moment, close to one-half of the total funds available for marketing research in Experiment Stations are relatively quite flexible. These funds constitute a very important segment of the total for good administration of marketing research.

While it is important that we continue to attempt to devise means of improving the administration of the various relatively inflexible RMA funds, practically we must realize that such funds are going to continue to be hedged in by restrictions and delays of one type or another. Let us then also adapt our marketing research programs to the funds available. This means, in general, (1) that we must look ahead at what the problems are likely to be three to six years hence and use inflexible funds for investigating these types of problems; (2) we must keep our flexible funds available for the “emergency” types of problems that arise; and (3) we should use a larger share of our inflexible RMA funds on “basic” research that will yield information that will be helpful for a wide variety of commodities, problems and circumstances.

Both Dr. DeLoach and Dr. Penn quite properly have given considerable attention to regional research. I am glad they have pointed out that some regional research was underway prior to the passage of the Research and Marketing Act and also that one of the principal contributions of the regional research procedure is to provide a means of bringing together technicians for a discussion of common problems.

I believe Dr. Penn should re-examine the regulations on 9b1 and 2 procedures. Titles and objectives, only, indicating the general nature of the work are required in advance by the Office of Experiment Stations at the request of the House committees on appropriations and agriculture. Similarly, the total 9b1 and 2 program, under present regulations, may be changed as much as 10 percent during the fiscal year for which funds are available. Projects under 9b1 and 2 funds that are not associated with regional or 10b cooperation rank next to regular federal grant funds and they in turn to state, receipts or gift and grant funds in administrative flexibility.

Barton De Loach emphasized lost motion in the west, but mentioned

that improvement is underway. May I agree on the lost motion, but emphasize the improvement? This has been stimulated by the Western Agricultural Economics Research Council both by discussion and by recommendations to the committees and to the regional directors.

It seems to me that this council, a sort of committee on committees for the western directors meets the qualifications of the proposal by Penn to finance such an endeavor out of 9b3 funds. The meetings are open and they are held either in conjunction with the Western Farm Economics Association or with technical committees.

Don't sell Title II short. Potentially it is a much larger source of marketing research funds than 9b3. At the moment procedures are not clear, it is difficult to determine what qualifies for support, matching funds are a problem, and "everybody in Washington, D.C. has to read and pass on every project proposed," but again improvement is in sight.

And, once more, do not neglect flexible funds. They are your ace in the hole.

The RMA by legislative direction and by administrative design has created and stimulated a rash of committees. Technical committees, councils, 22 industry advisory committees, policy committee, committee of 9 (8 old men and a nurse), ESMRAC. It's with committees as the entomologists say of bugs.

Big bugs have little bugs upon their backs to bite 'em
Little bugs have lesser bugs, and so on ad infinitum.

For the present let's classify them under only two headings—industry and professional.

First the industry committees. It's helpful to have them all meet at once. Spokesmen then work off a lot of their steam on each other.

By inviting industry groups to participate in research planning, and particularly if they get interested enough to put up some funds themselves, they become more interested in research. The big job in working with industry committees is to get their minds off their day-to-day problems and centered on a consideration of what will be useful five years hence. The wise research administrator will keep a little flexible fund sugar handy with which to be cooperative and handle some of the quickies. He will then encourage them to think long and hard about what are the basic, fundamental long-range problems.

Committees of professional workers have a real function in exchange of information; as a crucible for testing some untried or green ideas; as a means of bringing several specialized subject matter skills to bear on project planning; and as a means of raising the "norm" of research. Their big contribution is to be made in project planning—particularly what to undertake and how to start. From there on out our most valuable results will come from individual initiative and creative ability.

MAKING MARKETING RESEARCH USEFUL

F. L. THOMSEN

Production and Marketing Administration

IT WOULD be difficult to find a broader topic for discussion than the one assigned me for this round-table session. To make marketing research useful, it is necessary to (1) select significant marketing problems, (2) find solutions for them by applying adequate research methods, and (3) carry through with effective service and extension activities to insure practical application of the results. These three categories comprise just about everything in the administration and execution of marketing research, extension, and service programs. It is necessary, therefore, to limit my remarks to a few broad phases.

Right now about 50 percent of the consumer's dollar goes for production; 50 percent for marketing. If differences in efficiency of organization and management among individual marketing agencies are comparable with those among farmers, and if opportunities for technological improvement are as great, as I believe they are, we have no reason to anticipate a lower potential of improvement in marketing than in production. On the contrary, marketing offers the additional opportunity of improvement through changes in the *system* of marketing, as opposed to the efficiency of individual units, which is present in comparatively limited degree in agricultural production.

Some people say that the possibilities of improvement in marketing through research by public agencies are comparatively limited because the farmer has very little control over his products, once they leave the local shipping point. To me, this merely indicates the narrowness with which the scope of marketing research, service, and extension activities is viewed by many. The statement is valid only if we limit our research and other professional activities in marketing to those phases with which the farmer himself must deal. Actually, in order to encompass within our program the vast bulk of important marketing problems, we must be concerned with the marketing problems of marketing agencies far removed from the farmer. Our task in securing marketing improvement is largely that of effecting appropriate action by marketing agencies, not farmers. I believe that is possible, if we do effective research, extension, and service work directed at the operating problems of those agencies.

Some time ago, I addressed a few rather critical remarks in the *JOURNAL* of this Association toward what seemed to be rather obvious weaknesses in our agricultural marketing research. Along with some very nice bouquets, I received a few brickbats from colleagues whose sensitive skins apparently were allergic to frank criticism. To me, this is discouraging. Criticism, dissatisfaction with the status quo, a constant seeking for improvement, is the essence of science and of research. Are we to apply this searching analysis only to the marketing system, and not to our own policies and methods as researchers? Other sciences are constantly on the alert to improve methodology and results. Marketing researchers, if marketing research is to become really useful, must likewise be willing to put themselves under the microscope for periodic self appraisal and constructive criticism.

This is all the more important now that Congress has launched us upon a much more extensive and intensive program of marketing research, through the Research and Marketing Act of 1946. In my opinion, if this financial support is to be continued and expanded we must take the steps necessary to make our marketing research really useful, or the funds will be reduced or diverted to other subject matter fields where useful results are obtainable.

We have built up a considerable knowledge of what the marketing system is and how it operates. This knowledge, arising from a multitude of descriptive research projects dealing mostly with the comparatively unimportant aspects of marketing with which the farmer comes directly in contact, has prepared us to teach elementary courses in marketing and to counsel against wild-eyed marketing schemes that reflect a complete misunderstanding of actual market conditions. But it has not constituted a basis for important constructive improvements in marketing. We have built a foundation without continuing on to erect the house upon it. Yet we have been at this business for three decades or more, and can no longer cite the infancy of our science as an excuse.

I find, in discussing this subject with colleagues, a distinct tendency to confuse the "pure research" of the physical sciences with the sort of descriptive research we have been doing in marketing. It is pointed out that many of the most useful physical discoveries have resulted accidentally from research undertaken with no thought of useful application, or from later applied research based on the foundation laid by pure research. The atom bomb is a favorite example

offered in support of this thesis. Without granting that these instances are the rule rather than the exception, and calling attention to the relatively large volume of applied physical research which is directed at specific problems, I would remind you of some fundamental differences between the physical and economic sciences which relate directly to this problem.

In the physical world, conditions and relationships remain generally fixed. Once the properties of a given chemical substance are discovered, the description generally remains good for all time. Hydrogen sulphide smelled bad in my college chemical laboratory in 1915, and it smells just as bad now! No pure science researcher correctly described the physical properties of a group of chemicals as of 1939, only to find the same research organization starting to do the same job all over again in 1948 because the description was out of date. Pure or descriptive research in marketing is different in too many vital respects from the pure research of the physical sciences to warrant the comparison commonly made.

If I were to list a large number of practical, important marketing problems, the solution of which might contribute substantially to an increase in marketing efficiency or reduction of marketing costs, I am sure we would find that to many or most of them researchers have given little or no attention. This reflects a good many factors, including the preference for descriptive research projects, the frequent lack of adequate training which marketing researchers need to deal effectively with the more complicated marketing problems, and the tendency to select projects which are safe, noncontroversial, and give promise of assured "success." If a researcher sets up a project to study "Some Economic Aspects of the Marketing of Nebraska String Beans," unless he is an awful dope he is sure of producing a bulletin containing some interesting if useless "economic aspects." But if he undertakes, even in cooperation with other researchers, to investigate the possibilities of reducing fruit and vegetable marketing costs by integration of buying and bypassing several layers of produce dealers, he runs into some really difficult problems of economic theory and research methodology, not to mention public relations. He may or may not wind up with a nice bulletin which can be added to the list he prepared for his next job application!

Yet, if we would get somewhere in marketing research, we must courageously attack difficult and dangerous problems. Administra-

tive officials must be gradually conditioned to giving support to such efforts. Researchers must prepare themselves to deal with problems requiring a higher order of training and ability than the simple descriptive studies of the past. And we must seek the cooperation of Congress, advisory committees, marketing agencies and the public generally in support for this kind of marketing research. All of this will not come in a day. It will require patience, perseverance, aggressiveness, and competence, over a long period of years. But of one thing I am sure: we will never make real progress on a useful program of marketing research until we set our own sights high enough to encompass the marketing problems which offer potential opportunities for accomplishing something worth while.

I wish that the time allotted to me permitted a review of types of subject-matter problems in agricultural marketing, and the specific changes of direction in project selection, which would, I believe, put us on the road to realization of the great potential usefulness of marketing research.

The second prerequisite for useful marketing research, adequate research methods, is a subject, and a big one, all by itself. All I wish to point out here is that on this score, too, we agricultural marketing researchers are not nearly realizing our potentials. Our standards of professional training and competence in marketing research are, in my opinion, far below those found in the physical sciences. In commercial marketing research, which has been making great strides of late, professional standards seem to have been rising much faster than in agricultural marketing research.

The suddenly expanded marketing research program created the very real problem of obtaining professionally qualified personnel. This situation might be expected to become rectified in due course, were it not for the difficulty of weeding out the untrained workers, and the more important fact that our educational institutions are still turning out very inadequate numbers of men well trained in marketing and research methods. Among the scores of recent graduates, having various degrees from B.S. to Ph.D., whom I have interviewed in the past few years, few gave evidence of real familiarity with the more important tools of research. Many even displayed little or no familiarity with elementary concepts such as the elasticity of demand or the frequency distribution. Few of them had more than vague notions about sampling problems in marketing

research and how to deal with them. The term, "controlled experiment," seemed as foreign to them as the names of the Greek cabinet. How can we expect anything in the way of sound research from these half-trained people, who have been hurried through a few semester hours of economic principles, elementary marketing and statistics, the while they were "broadening" the smatter of their knowledge with courses in land tenure, labor problems, and the like?

Effective marketing research, dealing with difficult and intricate marketing problems, is no simple task to be handled by those with a smattering of training in marketing, economics, statistics, and research methods. To make marketing research useful, we must make marketing researchers competent. That calls for constant raising of standards, both in research institutions and training centers. Recently I was invited to appear as guest lecturer at a special session for marketing researchers. One of the first things my friend, the regular instructor, said was, "Now, don't make it too technical. Remember, these boys are from various agricultural colleges, and anything not pretty elementary will go right over their heads." That remark epitomized everything I have been trying to say here about training for effective marketing research; as did another recent remark by a man who was responsible for employing some marketing researchers for responsible positions: "The main thing is to see that they have a good farm background and a good personality. They'll pick up the research part as they go along!"

But the selection of appropriate projects and the competent application of research methods will not insure the usefulness of marketing research. In many cases, the value of the research will not be realized unless it is *persuaded* into use by appropriate informational, extension, and service activities.

On the surface, that may seem to be a very trite statement. The general idea has been stressed some thousands of times by extension workers, editors, and others. But I wonder if we have ever stopped to think about what it means in connection with "extending" the kind of useful marketing research I have been talking about?

Our whole information and extension program, and many of our marketing service programs, have been set up with farmers as the extendees. Yet, as I have tried to stress, improvements in market-

ing generally cannot be put into effect by *farmers*, but rather depend upon action by *marketers*. It would be almost as logical to carry the story of improved farm production methods to railroad workers as to attempt to effect most potential marketing improvements by educating farmers alone. If we are to make marketing research fully useful, some ways of extending it to marketing agencies and consumers, as well as to farmers, must be found.

By this I do not mean to imply that we should set up a whole new extension service to deal with people engaged in marketing in the same way that the present service deals with people engaged in farm production. I do maintain that the psychology, backgrounds, habits, and economic situations of marketers differ materially from those of farmers, and that we will not get far in extending the results of most marketing research by using personnel trained only in farming and agricultural extension methods, or by applying some of the extension devices which have been successful with farmers. We need an approach new in many respects, adapted to the job of training marketing agency personnel. Even if time permitted I could not suggest many features of such a modern marketing extension and service program. It is a really new subject, considered from this standpoint, and all that can be done here is to highlight the need, for the consideration of all of us who are interested in making marketing research more useful.

I hope this broad and generalized, and perhaps too pessimistic discussion of the subject is not a disappointment to those who came here expecting to be regaled with some specific examples of useful marketing research. I understand that some others on the round table will make good that deficiency in my remarks. Even though generalities are nearly as unpopular as criticism, I felt that I could make the best contribution to our round-table discussion today by iterating and reiterating what I believe to be some of the most important considerations governing the future usefulness of our expanding marketing research program.

EXTENSION'S ROLE IN GETTING RESULTS OF MARKETING RESEARCH TRANSLATED INTO ACTION

J. Z. ROWE

New Mexico College of Agriculture and Mechanic Arts

HISTORICALLY, the Extension Service has always recognized its responsibility to farm people in the field of marketing education. This responsibility was pointed out in past basic legislation creating Extension work in agriculture and home economics. However, the passage of the Research and Marketing Act sharply focused this responsibility. The passage of this Act, it seems to me, should call for a revaluation and appraisal of Extension's activities in bringing the results of marketing research to bear upon our farm problems. In the past, Extension's efforts have largely centered upon marketing education at the farm and home and possibly with farm marketing organizations, especially cooperatives, at the local level. If the Extension Service is to shoulder the larger responsibility as outlined in the Research and Marketing Act, it will be necessary to enlarge both the areas in which we work and the clientele with whom we work. In our marketing educational work, we must not only make contributions toward the application of research at the farm and home, but we must go further and develop techniques and methods so that marketing research will be of benefit in areas beyond the local situation.

Research into the multitude of problems affecting marketing and consumer education was also given impetus by the passage of the Research and Marketing Act. How quickly the Extension Service can expand its marketing educational work will be determined in a large measure by how quickly the results of research become available and how rapidly Extension can expand its efforts in disseminating the research findings available.

Although we do not have the vast background of marketing research that is needed for many problems, there are sufficient data and experience through which to attack a few specific marketing problems. It is true that most of this data must find its application at the local level. However, this is not unfortunate in all respects. In order to implement an expanding program in marketing education, more personnel will in all probability be necessary. This personnel will probably come from new and young workers. They may

have had varying amounts of academic training in marketing, but they may have had little experience. Thus, as new workers gain confidence and experience in working with marketing problems at the local level, the worker can move on with experience and accomplishment behind him when more research in the larger areas becomes available. The application of marketing research, it seems to me, has special problems. Consequently, in order to maximize the usefulness of marketing research, it should be made available as soon as possible.

In order to picture more concretely how one Extension Service has approached the problem of taking the results of marketing research to the field, perhaps it would be well to outline the procedure taken in New Mexico. We based our program upon the needs of the people. It was felt that in this work, some indication from the rural people of New Mexico would be worthwhile in crystallizing our thinking on a problem approach to marketing. Our county agents were asked to determine as nearly as possible from planning groups and others what problems were of most concern to the rural people in their county. From these suggestions, some twenty major problems were determined.

These suggestions formed the basis for planning our marketing program as well as the entire Extension program. They were examined to determine, first, if we had enough research background in order to develop effectively an educational program and, secondly, if our resources, especially with respect to personnel, were adequate to apply effectively research findings to the problems submitted. As a result of the appraisal using these as criteria, some problems had to be deferred as needing more exploration while still others presented opportunities upon which we felt we could develop an objective marketing educational program.

After culling and selecting, project statements were written for eight projects. At the present time, we are actively carrying on work with only five projects. In drawing up these projects, experiment station personnel and, where appropriate and available, other groups and organizations were called upon to participate actively in planning. I might add, these same groups still are an important part of our marketing program. We call upon them from time to time in discussing the progress of the work and ask for their suggestions and recommendations.

In determining just which projects would receive attention first,

a priority was given to each project. Priorities were determined by how frequently reports from the counties indicated need and by our opinion as to our ability to do the work.

We believe that the marketing program is just a part of the overall Extension program. Such being the case, wherever possible, all members of the Extension staff make their contribution to the program. Subject matter specialists of the particular commodity under consideration are technical supervisors. The Extension Economist is charged with general supervision of the projects. The work done on marketing, whether it is our regular marketing program or work in connection with RMA projects, is centered around the county agent's office. We believe that he is the important cog in contributing toward effective marketing education and, that he is vital in expanding Extension opportunities in the marketing field. This means that we must develop programs which will give marketing training to agents and supply them with information which will assist them in the solution of local problems.

The marketing work we are doing for the most part has been localized but we feel that this work must be expanded to larger areas for maximum accomplishment. Those regions which are the most important from the standpoint of volume of production of the commodity concerned and where the problem is most pressing are receiving major attention at the present time. Our workers in marketing did not rush into the program, but they spent time in talking with producers, handlers and consumers. We felt that by getting well acquainted with the area, the people and its marketing institutions, we could be upon firmer footing. Because farmers and the trade have been contacted previously on the particular marketing problem involved, the acceptance of the Extension Service as an educational force in the marketing field was spontaneous for the most part. It seemed that both producers and the trade at the local level welcomed the opportunity for help.

In applying the results of marketing research, we are using the well established Extension methods. We have found these especially adapted in working with producers. We are stressing marketing educational work with our 4-H groups. It is our desire to develop within our farm youngsters an awareness of the marketing problems involved in agriculture and present to them at an early age such findings as are available. In order to work more effectively with trade groups, in some cases we have found it necessary to be more

specific in demonstrating Extension Service techniques of education. We have found it effective to work through not only producer organizations, but also civic organizations such as chambers of commerce, service clubs and the like which have a high percentage of businessmen. The continuation of their confidence in our ability to work in the field of marketing education will depend upon how effectively we do our job. We must take the research findings and apply them in an educational way so that they may find practical application in everyday buying and selling.

The inevitable question might now be asked just what progress our educational marketing program is making. In view of the fact that all educational processes involve time, we are reassured with the progress we have made. I shall comment only on those projects upon which we are doing intensive marketing work.

The project dealing with the certification and identification of our long staple cotton has received outstanding backing by trade sources and farmers. In 1948, of the approximately 380,000 bales of this long staple cotton produced in the area under this project, almost 90,000 bales of 1517 cotton were tagged. Only 25,000 bales were tagged in 1947. Although the 1948 figure represents a substantial increase, it is still insufficient to be of any great commercial value. During this time we naturally found some factors which we believe contributed to a lack of fuller participation on the part of growers in the identification program. We have changed our procedure in order to eliminate these. Reaction to this certification and identification program has been especially good from spinners.

In working with producers and milk handlers toward the quality improvement of milk and cream, we also have received good cooperation. Although statistics are not available at this time showing the improvement of the quality of these dairy products before and since the marketing project was begun, managers of all three of the major milk plants in the area have indicated that the quality is higher than in previous years. Local sanitarians and inspectors as well as the state dairy commissioner have indicated that the project is showing unusual results in bringing about a higher quality product. The number of cans of cream rejected is down, sediment tests are improved and bacteria counts are lower. Grade A milk quality has been improved but reports seem to indicate that the greatest improvement in quality has been made in Grade C milk. We feel encouraged at this statement from the dairying industry

since last year we shifted our emphasis toward working more with Grade C producers than Grade A.

Due to the relatively unfavorable reputation of eggs from New Mexico, we are carrying on a project dealing with marketing quality eggs and consumer education. We believe that at least a part of egg quality consciousness on the part of producers and handlers is a result of this work. Assistance has been given to plant managers in the handling and candling of their eggs and in their storage problems. Perhaps of greatest significance is our work with buyers in an educational program directed toward the use of grades as a basis for purchase. Just recently one city in the eastern part of the state has begun a program to buy on grade. Grocery stores who purchase eggs from farmers are also buying on grade. In carrying on educational work with the consumers, we have been surprised at the large number of inquiries for information and requests for demonstrations on the various grades of eggs and their uses.

Our project on wool has met with enthusiasm on the part of producers but has not received the same response from the wool buyers. Upon initiation of our wool program, an attempt was made to skirt the wool. Working with the New Mexico Experiment Station in the spring of 1948 under the existing market conditions, fleece skirting did not seem advisable. Therefore, fleece grading at the ranch was emphasized. Grading of the wool at the shearing shed, we feel, has proven to be less time consuming and easier than at some point after the wool is sacked. Over 300,000 pounds of wool has been handled on a demonstrational basis since this program started. Since the grading of fleeces at the ranch is a new concept for New Mexico ranchers, we are devoting increased attention toward training county agents in this procedure.

A new project deals with the rating of rams. This is another new concept whereby ranchers may buy good sires sight unseen. We hope by the system of ram certification that a pool of desirable individuals might be obtainable in the state which will increase the return of clean wool per fleece. Already 155 rams have been certified as to clean wool production, type of body, staple and length of wool, degree of body wrinkles, and amount of face covering. Standards have been set up for all of these factors and grading and certification has been done accordingly. Interest in this program has already been manifested by buyers who need rams for use in their herds.

The newest project which we are just initiating is in the field of consumer education. We will direct practically all of our efforts toward working with urban groups. Best buys, selection and care of fresh produce, nutritional benefits of various foods and information on the food situation will receive major emphasis in this marketing work.

These are just a few highlights of our marketing projects and some indication of the progress we are making and the approaches we are taking. We feel that we are making progress but recognize that we are a long way from our complete objectives.

In conclusion, I would like to point out a few things, which in my opinion, will be necessary if both research and education in marketing are to show maximum accomplishment. First, I think it is extremely important that research and Extension personnel should work together as never before. Research and Extension should maintain a continuous two-way exchange of ideas. This would mean that Extension could keep research informed of changing conditions and new problems and research could furnish new findings for Extension to use in the field.

Research is needed by Extension at the local level. Also, in order to expand our marketing program to new areas and new clientele, we need research on national and regional problems. This would require an over-all approach to marketing without regard to political boundaries.

Extension, too, must find ways to attack regional marketing problems as research becomes available. State Extension Services must find means to bridge the gap that has for the most part restricted their activities to problems within their own state.

Extension must get new workers trained in marketing and enlarge the experience and training of present staffs. County agents, as mentioned previously, must be a part of this program and in many cases they must be trained.

Extension must expand its activities in working with the trade and consumer in this marketing work.

To broaden our marketing program presents a challenge and a responsibility. Without research, Extension marketing work will be ineffective; without Extension carrying the results of research to the field, much of the timeliness will be lost and effective application will be minimized.

EXTENSION'S ROLE IN GETTING RESULTS OF MARKETING RESEARCH TRANSLATED INTO ACTION

KENNETH HOOD

Pennsylvania State College

IN THE last few years we have been making considerable progress, largely as a result of increased funds made available by the Research and Marketing Act. The results of many new research studies are becoming available. Extension has increased its marketing force and is now engaged in translating these and other research findings into action. But we often feel impelled to repeat the last words of Cecil Rhodes, the great British-South African statesman, "So much to do; so little done."

The question before us is—How can Extension do a more effective job of getting research information used?

A close working relationship between Extension and research personnel is highly important. Extension men with their contacts in the field often are able to advise concerning research work that needs to be done. The research men can keep Extension informed about the progress of studies that are under way.

In many institutions, an Extension man serves on the advisory committee of each research project. It is also a common practice to hold periodic meetings of the two groups to exchange information on research findings and Extension teachings. County agents are brought into these joint conferences occasionally to present the viewpoint of those who are more closely associated with farmers.

Research personnel should be used when feasible in some Extension work. In this way they can learn what farmers and others engaged in marketing are thinking and what their needs appear to be. These contacts should help keep research on a more practical basis. Undoubtedly, there are many research studies that have been undertaken with little thought given to what use would be made of the results.

Marketing Specialists Need More Training

Many of our marketing Extension specialists are inadequately trained to do what is expected of them. Usually they have a working knowledge of statistics, accounting, agricultural prices and economics, but this is not enough. They need to know in addition

a great deal about the commodity with which they are working. There no doubt are some who would disagree with this statement, but there are many marketing economists who list this as one of their most serious weaknesses. One extension economist in the East who was turned into an egg marketing specialist was heard to remark "I was an Extension economist, but I am now a specialist in egg marketing and I don't know a thing about eggs nor how they are handled." His solution was a short leave of absence during which he worked with the egg trade.

Moreover, it is my observation that the best marketing work is done by those who specialize along commodity lines. The problems of milk marketing are vastly different from those encountered in the marketing of grain or wool. It is physically impossible for most men to be well informed about the peculiar marketing problems of many different agricultural commodities.

Marketing specialists sometimes fail because they try to do the job alone. Why not make marketing a project in which all extension personnel can play a part? Is it not true that marketing begins with production and ends with consumption?

The dairy specialist, the agronomist, and the farm management man as well as the milk marketing specialist are involved in the problem of how to get more fall milk in order to meet consumer needs during the months of low milk production. This is more than a job for the marketing specialist. Certainly feeding, breeding, management, pasture treatment and cost analysis have parts to play in this effort to smooth out the seasonal maladjustments in milk production to meet the needs of the market.

The marketing of potatoes begins with the production of the best varieties for the market and extends through proper care in digging to good grading and packaging and on through to distribution and food preparation. Here the plant breeder, the agricultural engineer, the marketing specialist, the nutritionist and many others are needed to produce and sell a good marketable grade of potatoes at a profit.

We Must Work with Individuals and Organizations

Sometime Extension fails to translate research results into action because too much time is spent in preparing reports, writing news articles and giving speeches and too little time is spent in working with those who have a marketing job to do. Extension

men must have contacts with farmers, consumers, cooperatives, wholesalers, jobbers, chain stores and others in the trade and *work with them*. We don't operate in a vacuum. Our information is only helpful in so far as we can get individuals to use it.

At the Regional Extension Marketing Workshop which was held at Pennsylvania State College in the spring of 1948, the marketing people in the Land Grant colleges were criticized—both research and Extension—for spending too much time at the farm level and too little in dealing with a solution of those marketing problems which arise in processing and distribution.

In an address entitled "Broadening the Field of Extension in Marketing Work," Edwin W. Stillwell, Vice President of the Farm Market Relations, Inc., said at this workshop:

"For many years experiment stations and the Extension Service concerned themselves only with problems relating to production. The development of Outlook reports expanded the horizon somewhat. Here and there real progress has been made in dealing with specific and real marketing problems. By and large, however, these organizations and the Department of Agriculture itself have worked with a "Chinese wall" which was erected at the wholesale level. Little consideration has been given to the problems occasioned by the movement of agricultural products to and through the retail store and into the paper bag—the last stage in the sale of the product to the ultimate consumer. . . . If the Extension Service really is to broaden its field in marketing, it is going to have to pierce or knock down this "Chinese wall." It is going to have to extend its teaching into the problems faced by the retailer and to consider the wishes and foibles and changing habits of the consumer. This is true because the consumer making his or her selection from among nearly 2,000 items in a modern grocery store is the one who determines finally whether the production of a commodity will be profitable or otherwise."

If we are to meet this challenge, we must move on into these comparatively unworked fields.

The marketing of farm products does not stop at the farm nor does it stop at state lines. Many times, the state marketing specialists have been handicapped in their efforts to follow commodities through to markets because these products move out of the state. Travel funds for out-of-state work usually have been drastically limited. The Research and Marketing Act with its provisions for regional work should prove of inestimable value to those who have an interest in working with people who are engaged in transportation, processing and distribution.

In late years, we have been entering vigorously into the con-

sumer education field. To be most useful here, we should not limit our activities to information on supplies, prices and consumer use. We need also to stress the costs of various marketing services and help consumers to decide how much service they want to pay for. It might also help consumers if they knew why they have to pay 21 cents for a quart of milk and 71 cents for a pound of butter.

Many times our Extension people limit their usefulness by assuming that the entire marketing field is theirs. Whether we like it or not, we must be ever mindful of the fact that there are many other agencies and groups carrying on educational work in marketing besides Extension. A good Extension marketing program is one that tries to secure the cooperation of these other people in carrying out a broad action marketing program that will be beneficial to all.

Another question that keeps being asked in our discussions relative to the proper use of research information is: How can we get the results before the information is too old to use? Research is a slow process and sometimes a long period of time elapses before the information is ready for publication. Would it be possible to make more use of preliminary results? Can Extension surveys supplement the more comprehensive studies of the research men?

So far in this paper we have been discussing the ways in which Extension can secure better results in the marketing field. In dealing with the problem at the farm level, there no doubt is a place for agricultural outlook and farm management information. With farmers, it's more than how to sell; it's also when to sell and what to sell. A knowledge of price trends, costs, seasonal influences, market preferences, consumer demand and governmental policy are all necessary if the farmer is to make wise marketing decisions. For many years, the Extension people at Penn State College have been combining marketing, agricultural outlook and farm management in one discussion. When this type of meeting is built around a commodity, it is very effective.

We Must Improve Our Methods of Extension Teaching

It is difficult for us to admit that our work in marketing is not reaching as many people as we had hoped. Can it be that we lack luster and appeal in our techniques?

Let's see how others attract the crowds and obtain a following.

Prizes, contests, acrobatics, dramatic skits, sound movies, glamour and human interest are all used to get people to come out to meetings and to hold their attention while they are there. Billboards, multi-colored posters, radio commercials, cartoons, attention-getting exhibits and advertisements well illustrated by highly paid skilled artists command the attention of the average American at every hour of his daily and nightly rounds.

Can we compete with these attractions and still tell our story in such a way that people will come to our meetings and read our marketing information? It is possible, but we must change our techniques to fit the times. We must use all media that are available for Extension teaching. Among these are slides, posters, exhibits, dramatic skits, sound movies, radio, television, news articles, envelope stuffers, well-illustrated talks, round table discussions, marketing tours and industry-wide conferences.

We'll have to improve our writing. Too much of our material is stilted and difficult to read. We write for the high school or college graduate and most of our reading public has never seen the inside of a high school class room.

We must make it easy for people to become better informed about their marketing problems. If we fail in this, many of the people who most need our help will never be reached and much valuable new research information will not be used to the best advantage.

Everybody from the farmer to the consumer gets very much interested in improving marketing methods and cutting distribution costs when prices start to sag and marketing costs remain high. We are indeed fortunate that we can go into this period of declining farm incomes and reduced business activity with a wealth of new market information. The question now is: How can we get enough men to do the big job that lies ahead? Frankly, there are not enough trained marketing people in the country to perform this task. We must train county agents, cooperative field men and directors, service men of private organizations, Vocational Agricultural teachers and local leaders to take a hand. Not all of these people can be used for all phases of marketing work as some of the problems are exceedingly complex and ever-changing, but we'll get nowhere by shrugging our shoulders and saying we cannot use them. The job is too big for the trained Extension specialists to do alone.

METHODS EMPLOYED IN AN ANALYSIS OF THE SPREAD BETWEEN FARM AND CONSUMER MILK PRICES IN NEW YORK CITY

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Purdue University and Stevenson, Jordan, and Harrison, Inc.

IN MARCH, 1949, the New York State Temporary Commission on Agriculture released a report, "An Analysis of the Spread between Farm and Consumer Milk Prices in New York City under Present Practices." In this paper, which is based on the report, we propose to discuss the methods and special techniques which were employed in the study rather than the results.

Before proceeding further, however, it will be well to describe briefly the New York milk market and state the objectives of the study, since these considerations were responsible for the methods of study finally adopted.

Milk for distribution in the Metropolitan Area was received through 433 approved country receiving stations of which 343 were located in New York State. Eighty-one different companies or groups of associated and subsidiary companies shared the ownership of these 343 country plants. There were 21 fully integrated companies, i.e. with country plants, city pasteurizers, and routes. In 1947, 72 percent of the country plants included in the New York pool limited their operation to receiving, weighing, testing, cooling and trans-shipping milk.

Pasteurizing, Processing and Bottling in New York City

Except for a very small quantity of special milk, all milk and much of the cream distributed in New York City is pasteurized and packaged in approved plants in the marketing area.

There is little difference in the functions performed in these various classes of plants. The following classification is useful principally for purposes of describing the nature of the companies engaged in the business.

(a) *Plants operated by integrated companies which do little or no processing for others.* A large portion of the milk business is included in this classification. Most of the large companies in the group are self-contained. Included in this group are a number of smaller companies with wholesale outlets only. Frequently, they are somewhat specialized in their sales.

(b) *Plants operated by integrated companies which do a substantial business in processing and bottling for other dealers.* In general, companies in this class are (1) fairly large; (2) have a country supply of milk in excess of their own requirements; (3) offer a wide range of products and services; (4) have a wholesale business of their own but no retail routes.

(c) *Plants operated by companies with city routes but without a country supply of their own.* Companies operating plants of this type are generally smaller than average. Their supply of milk is furnished by other dealers or purchased from independent proprietary companies operating country plants or from cooperatives. Frequently, arrangements for the milk supply are negotiated through milk brokers.

Distribution of Milk and Cream in New York City

New York City's milk and cream is distributed to homes through 2174 retail routes and to stores, hotels, restaurants, and other wholesale outlets through 1626 wholesale routes. Most of the retail routes have A and B sections as a result of the introduction of every-other-day delivery in 1942.

In order to service areas distant from the plant and to avoid congestion in loading at the plant, depots are used in certain instances. With the advent of motor truck delivery there has been considerable decrease in the practice of using depots. Nevertheless, 39 percent of the retail routes of multiroute companies and 83 percent of the retail peddler routes originated at depots. Only 11 percent of the wholesale routes originated at depots. Depots are of three general types.

(a) *Depots of integrated companies serviced by the companies' own processing plants.* Packaged milk is loaded into vans and hauled to the depot, which consists of an ice box, office, and garage. The milk is loaded on to route trucks directly from the vans. It is distributed and accounted for in a manner similar to that employed when routes originate at the plant.

Each point of distribution, whether at a depot or plant, may have some depot functions. For example, a company with several processing plants may elect to produce a certain item at one plant only. This product then would be distributed through all branches, including those at other plants. Similarly, companies distributing from their own plant only and without outlying depots, may dis-

tribute items not produced in its own plant but purchased and delivered to it by another dealer.

(b) *Depots operated by companies without processing facilities of their own.* Most common is the depot operated by a small wholesale company which distributes a finished package of products purchased from or processed by one or more other dealers. The route trucks are loaded with all or the major part of their loads at the loading platform of the supplying company. Minor items are loaded from the ice box at the company's own depot.

(c) *Depots operated by peddler supply companies.* There were in 1948, 349 retail peddler routes in operation in the five boroughs of New York City. Usually the peddler supply company buys a finished package of milk or products from a company with pasteurizing and bottling facilities. This milk is van-loaded to the depot of the peddler supply company where it is reloaded directly from the vans onto the retail route trucks of the peddlers. The peddler supply company furnishes ice box and office facilities, bottles, caps and cases, and takes care of route returns. It maintains its brand name, exercises certain control over quality, advertises the brand, and provides a general supervisory function for the peddlers essentially similar to that provided in depots of fully integrated companies.

Of the milk which finally reached the consumer in homes in New York City, 28 percent was on home delivery and 72 percent was through stores in 1948.

The average prices paid by consumers for milk varied from a low of 20.6 cents per quart of plain milk for non-advertised brands in stores to a high of 24.9 cents per quart for advertised brands of homogenized milk at home delivery. The principal variables are: (1) advertised brands and other brands; (2) plain milk and homogenized vitamin D milk; (3) glass bottles and paper containers; (4) one-quart and two-quart containers; and (5) retail sales through home delivery and through stores.

The difference between average home delivery prices of peddlers and of advertised brands was determined to be 1.8 cents for approved plain milk in glass quarts and 2.0 cents for homogenized Vitamin D milk in glass quarts.

There was little variation in the resale price of advertised brands, but independent distributors were likely to give price concessions

to consumers or merchants who took a large number of units per stop.

At retail, two large companies had most of the business. This milk sold at a premium over unadvertised brands. The remainder of the retail business was split among four smaller fully integrated companies, 27 small retail distributors, and 349 peddlers.

At wholesale, more uniform conditions prevailed, although the advertised brands of milk moved into stores at a premium price over unadvertised brands. In the wholesale business, four large companies had about 45 percent of the business. Twenty-eight smaller companies with their own pasteurizing and bottling facilities had about 45 percent of the business and 43 small companies without pasteurizers had 10 percent of the business.

This study of the "spread" in milk prices between the farmer-producer and the New York City consumer was undertaken to determine the costs borne and the profits earned by the various agencies engaged in getting milk from the farmer's platform to the consumer. It also was the expectation that facts would be discovered which would make it possible to effect economies in this process.

A brief review of the data just reported will suggest that ordinary statistical treatment will not serve. In the search for a method of study which would reveal the true facts with respect to costs and permit realistic and profitable comparisons, a determination was reached to make the analysis on a functional basis.

There are clearly defined jobs (functions) that must be performed in getting milk from New York State farmers to New York City consumers. Each of these functions must be performed in a similar manner whether by a fully integrated company, which performs all the functions, or by an independent proprietorship or cooperative, which may perform only one.

For each function a carefully selected sample was obtained so as to reflect: (1) size and location; (2) ownership; and (3) type of operation.

Functions Included in the Study

1. Country Hauling—the average cost of custom hauling was used.
2. Pool Service—actual assessments by the Market Administrator and actual payments to cooperatives were used.

3. Country Receiving and Shipping—detailed time and cost studies were made.
4. Transportation from country plants to city pasteurizers—actual costs were determined from companies' books.
5. Pasteurizing, Processing and Bottling—detailed time and cost studies were made.
6. Platform and Loading—detailed time and cost studies were made.
7. Depots—detailed time and cost studies were made.
8. Retail and Wholesale Distribution—detailed time and cost studies were made.
9. Distribution through Stores—a detailed study of stores was made to determine buying and selling prices for milk, mark-up of comparable items, volume of milk handled, and kind and amount of services performed.

Each of these functional cost studies was made in a manner to reveal:

1. Dollar costs for the latest 12-month period available at the time of study for each company.
2. Unit cost in hours of labor and quantities of materials, supplies, and services.
3. Median costs and range in costs among those performing the functions.
4. An explanation of differences in costs among those performing the functions.

Costs were allocated within the function according to uniform procedure. This was done by a careful analysis of money costs as reported on the company's books. Costs were determined and allocated to functions and to products on a basis of engineering studies of time, space, power, materials, and service utilization. For each function, costs were determined for each separate process. Product costs were determined for each identifiable product.

A preliminary field review of both the books of account and the methods of operations in country plants indicated that these costs could be expected to vary according to the following factors:

1. The volume of milk being handled in each plant.
2. The number of cans of milk per producer.
3. The age of the plant and its equipment.
4. Administrative overhead.

A stratified sample was selected on the basis of these factors which were expected to influence costs. The operations were time studied and the labor and expenses for a twelve-month period were summarized. The results of these calculations showed country plant

costs ranging from a low of .350 cents per quart to a high of .589 cents per quart. This beginning difference in spread required for country plants is equal to the profits claimed by milk companies in their public statements.

City processing plants are highly mechanized in their pasteurizing and bottling procedures. Health department regulations establish a high standard for the cleanliness required for all operations. Total city plant labor and expenses, however, were found to vary by as much as one and a half cents per quart. Varying pasteurizing techniques, different bottling speeds, different degrees of labor utilization, and varying practices for loading and checking the trucks were found to be criteria for cost differences which again were used as the basis for selecting the stratified sample to be included in the survey.

Truck distribution to private homes, to stores, and to restaurants creates more cost per quart than any of the other functions between the farm and the consumer.

Detailed time studies of several thousand home delivery calls showed significant differences between the costs incurred in delivering to various kinds of customers. Consumers living in fifth floor walk-up apartments and receiving only two units with each delivery call and requiring weekly cash collections by the driver create obviously greater costs than consumers living in row houses taking four quarts with each delivery and paying their milk bill by check once a month. Any audit pooling of these varying conditions into an average cost per quart obviously obscures many of the causes for high costs of distribution.

A basic difference in procedure was also recognized. Some companies spend as much as \$7.67 per route day for selling and administration functions on their routes. Other routes are operated by individual entrepreneurs who own their own trucks and whose expense for selling and administrative functions can be evaluated as low as \$.94 a day. The economic justification for selling and administrative expenses in the amount of \$7.67 was brought under scrutiny because routes so administered served only 135 customers a day with an average of 2.86 units per delivery. The individual entrepreneur, however, who combined selling and administration with the physical work of milk delivery served 177 customers per day with an average of 2.83 packages. The differences in consumer buying habits and company operations combined made a difference

per quart of almost 3 cents in the cost of distributing milk to homes.

This functional analysis of home delivery also clearly indicates that home delivery costs are created as a given amount per customer call rather than as a given amount per quart. No significant cost difference could be found between serving a four-quart customer and a one-quart customer.

Store distribution costs were found to require similar detailed time study and cost observations. Some food vendors require daily cash collections by the driver as well as extensive in-store services, such as arranging the milk in the ice box and accounting for returned deposit bottles. Other store-keepers pay their bill once a month by check and do not permit the drivers to enter the store ice box under any circumstances. Some stores carry as many as four brands of milk and, therefore, require service from four individual companies each day. Others limit their milk purchases to two brands of milk and, therefore, have higher purchases from each of these two than if their milk volume were distributed among more dealers.

Delivery costs to stores, as a result of these differences in practices, varied by more than one cent a quart.

Profits per quart for distributing to homes ranged from a profit high of 1.3 cents per quart to a loss per quart of .8 cents. Including differences in selling prices, packages and products, store distribution functions showed a range from 1.6 cents profit to a loss for one enterprise of over 2 cents. These facts indicate the difficulty in attempting any generalization regarding the unit profit available for all companies under any given amount of spread. Evident also is the impracticability of attempting to lower the spread for the distribution of milk by a universal reduction in profit across the board. If the combined audited unit profit of all participants in the functions between farm and consumer were to be eliminated, very little could be accomplished in reducing prices to consumers or in increasing producers returns. However, substantial opportunities for consumer price reductions are within reach by having all participants in the spread emulate the most efficient practices and methods which are now in operation.

The combined procedures of functional cost accounting, time study analysis and market analysis do provide opportunities for searching step by step for those things which can be eliminated

from the spread and can bring the prices to producers closer to the prices to ultimate consumers.

Once the functional costs had been determined, the problem still remained as to how they could be presented. At one time it appeared feasible to present the array of costs within each function and select from this range certain measures as, for example, the median and first and third quartiles. These measures could in turn be presented in a cumulative series so as to report the absorption of the spread among the various functions.

Two principal difficulties to this procedure developed because of the nature of the New York market.

1. The spread differed among the distributors. Although milk was bought by all under a uniform price plan there were material differences in the cost of milk because of variation in fat content, transportation costs, premiums, and the like. Also, there were substantial differences in selling prices as between brands.

2. Each recognized function had been clearly differentiated from others. In each instance, cases were studied in which the particular function was the only one performed by the dealer or handler. Nevertheless, the complete functional analysis introduced an element of unreality since in practice most of the distributors carried on the various functions in a pattern of operation which involved considerable interdependence among the functions.

To meet these difficulties the results were finally presented company by company in parallel columns with the functional costs for each company displayed for comparison.

Other methods of analysis and presentation were considered. The time studies by functions could have been refined by detailed motion and methods analyses but this refinement might well be the objective of another study after the large opportunities for cost and price reductions made possible by adopting changes in the general practices have been accomplished.

Similarly, a model plant on a theoretical basis might have been developed from the information available from the case studies. This, too, may be the objective of another study.

With the method of analysis used the profit (or spread available for use and risk of capital) was the residue after all functional costs had been absorbed.

Had the determination of profit been a primary objective of the

study, the traditional audit method would have served better. This method places emphasis on end profit results, as shown by completed calculations, and a large gross sample is within reach at reasonable survey costs. The profit experiences of the participants can be related to the amounts of sales revenue, invested capital, and other indices of risks to establish a basis for moralizing about the rewards which are enjoyed by those who perform the essential functions. The combining of the audit results, however, assumes a uniformity in costs and in prices which may be contrary to fact. Assuming a uniformity in costs and prices also implies a uniformity in the methods, procedures, and arrangements by which the functions are accomplished.

Any method which undertakes to treat results of studies of this type by ordinary statistical procedures will encounter difficulties. The case method of study applied to a stratified sample appears best suited for either the audit or functional cost method. When the entire operation of assembling, processing, and distributing milk is broken down into segments, whether they be operating subdivisions or functions, statistical treatment is simpler. As the businesses are broken apart for study, the parts of the various companies bear a greater resemblance to each other than do the the companies when compared in their entirety.

THE MIDWESTERN EGG PROJECT

HERMON I. MILLER

Production and Marketing Administration

A STUDY of the deterioration of egg quality in marketing channels in 13 Midwestern states was undertaken last year by the United States Department of Agriculture and the agricultural experiment stations of those states. The project had three principal objectives:

- (1) To ascertain the quality of eggs at the time they are marketed by producers.
- (2) To determine the change in egg quality that occurs during the time that the product moves from the country buying stations to the central assembling plants.
- (3) To analyze market practices that influence quality change.

A Technical Committee provided guidance for the project. This Committee consisted of a representative from each of the 13 experiment stations, and a representative from each of the Federal agencies. The Technical Committee requested the Poultry Branch to act as coordinator for the project, and assigned the Coordinator the responsibility for developing suggested procedures and survey forms. Final decision on the scope of the project was made in November, 1947. Field work actually began in February, 1948.

Two steps in the procedure I think are worthy of consideration here. The first was the development of a work project outline which indicated in detail what, when, and how each cooperating agency would do the work which it was best fitted to do. The second was a meeting held in each state, to which the project leader invited all those who might be interested in the project—representatives of the State Department of Agriculture, Federal-State grading personnel, research, Extension and teaching members of the poultry husbandry and agricultural economics departments, and in some instances the State Agricultural Experiment Station directors. At this meeting, the objectives of the study and the work plan were discussed in detail. Insofar as possible, the sample of egg handling plants to be included in the study in each state was determined, and questionnaires, which previously had been prepared in preliminary form, were discussed. My own feeling is that this series of meetings was one of the important steps that contributed to the success of this regional undertaking. The research worker in each

state had complete support of his Administrator, the Extension workers, and others interested. Anyone within the state who was interested in the project had an opportunity at this meeting to contribute to its development. I strongly recommend these two steps in the development of all regional projects.

The work plan called for obtaining, as a first step, records of so-called egg concentration plants in the 13 states—plants where eggs are assembled for carlot shipment. These records were obtained by members of the Poultry Branch. The sample drawn consisted of 235 plants of this nature, well scattered throughout the region.

Information was obtained from the carlot assemblers about the buying stations that supplied them with eggs. The state agricultural experiment stations surveyed a sample of about 830 from the list of buying stations secured in this manner. The next step was to determine the grade of eggs moving through this procurement system as follows: In April, to represent the spring flush egg-production period; in July and August, to represent the hot summer months; and in October and November to represent the season of short production and high prices.

The services of the regular grading and inspection personnel of the Federal Department were used to determine egg quality. Each case of eggs inspected at a country buying station was identified with a sticker. The buyer was asked to handle the product in the usual manner, and when the sample of eggs which had been graded at the buying station arrived at the central plant, the same person was there to re-grade it. As previously indicated, this procedure was repeated three times during the year. During the three seasons we obtained gradings of 7,267 lots of eggs. The producers were identified on about 3,500 of these lots.

In addition to the field survey work the Bureau of Agricultural Economics obtained in April and in August, through mail questionnaires, information direct from producers regarding their marketing practices. With this background it is possible to determine the significance of the findings of the quality analysis.

The Farm Credit Administration studied the significance of graded buying programs and their influence on producer and handler practices. This work was confined to Missouri and Ohio. The Committee felt that graded buying programs might be one of the procedures that should be recommended to improve quality, and that this investigation might contribute to the soundness of such a recommendation.

Some of the Findings

The Committee recommended that two reports be prepared. The first covers the grading aspects of the study. This bulletin was printed by the Michigan Agricultural Experiment Station. The second, which will be printed in restricted numbers, will provide a great deal of background information regarding plant volume, merchandising practices, procurement procedures, etc., and will indicate the relationship of these factors to quality.

In addition to these two reports, a short, popular-style publication will be prepared by the Production and Marketing Administration. It will summarize the results of the grading work.

Quality of eggs received from producers. The producer lots representing eggs from the entire region for the three seasons averaged 66.7 percent A quality or better. About 11 percent of the eggs contained in these lots were classified as stains and dirties.

The 13 states were divided into three sub-groups, as follows: The Lake States, which included Minnesota, Wisconsin, and Michigan; the Plains States, which included the Dakotas, Nebraska, and Kansas; and the Corn Belt States, which included Missouri, Iowa, Illinois, Indiana, Ohio, and Kentucky. When producer quality was studied according to these three subdivisions of the region, we found that the Lake States had the highest and the Plains States the lowest quality for the three seasons. The greatest difference occurring during the summer months. The Lake States also had fewer eggs which were classified as stains and dirties.

The information on producer quality was analyzed to determine what influence, if any, several different factors had upon variations in producer quality. The factors studied were: (1) method of delivery, (2) method of sale, (3) size of shipment, (4) color of shell, and (5) type of buyer. The most significant findings in this analysis were those concerning the method of sale—that is, whether the producer sold eggs on a graded or an ungraded basis. Eggs sold on a graded basis averaged about 70 percent A's, as compared with about 60 percent for those sold on an ungraded basis, and the graded eggs contained less than half as many stains and dirties.

Quality changes during marketing. There was considerable loss in the quality of producer-delivered eggs while they moved through the country buying station marketing procedure.

The number of A quality producer-delivered eggs declined by approximately 10 eggs per 100 as they moved through the country

buying station. The number of checks contained in the eggs delivered by producers increased by approximately one percent. It seems to me that this is one of the more significant findings of the study. In the past, considerable emphasis has been put on educational programs with producers to improve egg quality, but little attention has been paid to the decline of quality of eggs as they travel through the marketing process. The deterioration study will provide our Extension Service and interested trade associations with facts upon which to base educational programs with producers and handlers as well.

Several factors were explored with regard to their relationship to quality change. The most important factor was the time between the first and second gradings. The effect of time and temperature, of course, is very much interrelated in its effect on egg quality changes.

I want to suggest several things which I believe are necessary if a regional research undertaking is to be accomplished successfully.

First—the project must be one which is truly regional in nature—i.e. one where states have a common problem that can be solved or answered thru similar research or one where it is necessary for each state to participate to provide a complete picture of the area to be studied.

Second, there should be complete cooperation from all the research workers.

Third, a coordinator should be selected and given authority and responsibility. The coordinator should preferably be a person whom the State project leaders choose because of their desire to work with him, rather than because he represents a certain agency.

The coordinator should have freedom to travel throughout a region and not be restricted to working inside the boundaries of a single State. On this point, too, I think that oftentimes a coordinator is selected who has a full-time job within his State and who therefore cannot give proper attention to the work throughout a region.

And finally, I think it is very important for each worker concerned with the research undertaking to feel that he has had a definite part in developing work procedures and plans, and that he is in wholehearted agreement with them. The meeting procedure is one way to bring this about.

DEVELOPMENT OF REGIONAL COTTON MARKETING RESEARCH

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THE Regional Cotton Marketing Research Project is conducted under the authority of the Research and Marketing Act and is subject to the over-all policies established by the Administrator of that act. The Technical Committee has assumed the authority for formulating policies for the cotton project in line with the over-all national policies and has accepted the responsibility for the operation and the development of the study. The Chairman of the Technical Committee and the Advisory Committee is responsible for carrying out the instructions of the Technical Committee and the handling of administrative questions.

Approaches Used

No hard and fast decision was made by the group regarding the type of regional research to be undertaken. They expected their first efforts on the project to be partially experimental in nature and to aid in determining the most productive approach to be used as the project developed. During the first phase of the study a uniform cooperative approach was attempted. During the second phase a looser form of collaboration or a coordinated approach was tried. At the present time the group has moved back in the direction of a uniform cooperative approach but certain problems will be studied under a coordinated arrangement. This shifting of emphasis from one approach to another can best be understood by briefly reviewing the development of the project.

Because of the delay in appropriating funds for the project and because of the shortage of personnel, it was impossible to develop specific plans for the first phase of the work until late in the 1947-48 marketing season. In January of 1948 the Executive Committee met with representatives of several of the cooperating groups and developed detailed plans for the first phase of the study. It was the desire of this group to develop a plan of work which would aid in delineating and classifying the problems of cotton marketing and in forming a basis for future planning of the project. In developing these plans, the group decided that certain basic information would be needed regarding the marketing practices in local

markets throughout the cotton belt and, therefore, a uniform or cooperative approach would be most desirable. The group also wished to investigate the extent to which the one-variety production program had affected marketing procedures and the study was conducted in such a way as to permit comparisons between communities which were organized for one-variety production with communities which were not thus organized. Uniform sampling procedures were decided upon and uniform schedules to be used by each state were adopted. In the development of the study, however, the uniform sampling procedure was not followed in all cases, either due to misunderstanding on the part of the cooperating states or because the representatives of these states felt that the proposed sampling procedure was not adapted to some local conditions. Also considerable variation developed in the interpretation of terms and questions included in the schedules. The delay in starting the project had prevented the establishment of a pilot study and even discouraged adequate field testing of the schedules. As a result, the schedules were not as well designed and the data secured not as useful as they might otherwise have been. These conditions made the preparation of the regional report more complicated and difficult and restricted the conclusions which could be drawn. Preparation of the regional report was delayed by the failure of some states to submit data to be included until many months after the field work was completed.

In the development of the first phase of the study several distinct but related problems presented themselves which warranted immediate investigation. If the cooperative approach followed during the first phase of the study were continued only one of these problems could have been considered at that time and the study of the remaining ones would have had to be delayed. Moreover, the states were not in a position to begin a belt-wide cooperative study of the cost and efficiency of marketing—the phase which was felt to be the core of the problem. Certain basic information regarding the marketing process was lacking, personnel needed additional experience, and certain research procedures needed to be tested. On the other hand if a looser form of collaboration were adopted and only one or two states worked on each of these related problems, some study might be given all the proposed topics immediately. The information developed in this way by each group of states would be supplementary to the information obtained by

other groups and it would not be necessary for all states to work on each problem. In view of the limited funds and personnel available and the pressing need for information on the several related topics, it was decided the best results could be achieved if a coordinated approach were followed and the efforts of the group were divided between the several problems. Some states, therefore, began a study of mill requirements and buying practices to determine the extent and nature of mill demand for cotton. Some studied the marketing of cotton identified as to variety and year and area of growth and investigated the possibility of expanding bale identification to a wider area as a means of improving marketing procedure. Others conducted a pilot study of means of reducing and increasing efficiency of marketing in order to develop and test methods and procedures which could be adapted by the remaining states in expanding this study in subsequent years. Still others devoted their efforts to an investigation of certain phases of one-variety cotton production which appeared to need further study.

The coordinated approach revealed information on a wider range of topics than would have been possible if the more restrictive cooperative approach had been used. By providing an opportunity for testing certain research procedures on a limited basis, this approach also enabled the group to discover errors in these procedures before they were applied to the entire region.

During the third phase of the study which is now under way, a combination of both the cooperative approach and the coordinated approach is being followed. Additional experience and the testing of procedures during the second phase of the project have enabled the states to plan and get under way a belt-wide study of the cost and efficiency of marketing cotton through various channels. Variations in marketing practices from one area to another revealed in an early study, suggested the desirability of approaching this problem on a belt-wide basis and of employing uniform sampling procedures and uniform schedules. In addition to the belt-wide study in which most of the states are cooperating, the study of some problems already under way are being continued. Some states which are cooperating on the cost and efficiency study will also do some further work on mill requirements and buying practices, the marketing of cottonseed, or one-variety cotton-production. Others will conduct detailed cost studies of certain segments of the marketing system to provide factual information regarding these seg-

ments and also to test various methods of conducting costs studies which can be used by other states in the further development of this phase of the project.

The group is aware that the study of cost and efficiency of marketing cotton through various channels will be an extremely difficult and complicated one. It is also realized that even under the most favorable conditions this study will require a number of years for completion and if it is to succeed at all, it will require the cooperation of a large part of each segment engaged in the marketing process. In developing the study the workers will need the constant aid of statisticians, cost accountants, transportation specialists, industrial engineers, and others. This is a very ambitious program, particularly in view of the continued shortage of personnel and funds and the lack of experience of available personnel. In spite of these many difficulties facing the group, it is believed the importance of this problem justifies starting the study at this time. The study can reveal information of great benefit to the cotton marketing system and if the group working on this project is given adequate time and funds to develop the study in a careful and detailed manner, a valuable contribution will be made toward improving the competitive position of American cotton.

Some Benefits and Problems

The studies already completed or under way have provided a considerable volume of basic information regarding marketing practices of producers and buyers in local markets and the operation of gins, warehouses, and mills. Information has been developed regarding the one-variety cotton producing communities which certain agencies have already utilized to a limited extent in developing their programs. Fragmentary information has been obtained on the movement of cotton from local markets to mill points and on the functioning of the agencies involved in this process. The direct results of the study, however, are of less importance than such indirect benefits as the training and experience provided research workers and the contacts which have been established with various segments of the cotton trade. Also of great value have been the testing of various research procedures and the determination of the procedures which promise to yield the best results. Unfortunately, procedures and tools of analysis have not been

developed in the field of marketing research to the same extent as in some other fields of agricultural economic research, but must be developed before very rapid progress can be made.

In the conduct of the study certain difficulties were revealed which are due to the character of marketing research and which are common to all research in this field. In the study of marketing the research worker comes in contact with a number of economic segments, many of which may be unfamiliar to him. Producers, buyers, representatives of transportation agencies, processors, wholesalers, and retailers may all be contacted. Neither the training nor experience of most agricultural economists has fitted them to work with all of these various groups. Each of these segments is possessed of its own highly specialized field of information and the researcher must have a considerable knowledge of each field if he is to develop his relationships and conduct the study efficiently. A knowledge of general economics is required, however, for proper interpretation and thorough analysis of data. In the past, relatively little emphasis has been placed upon training along these lines and the opportunity of gaining experience in this field has been limited. Certainly few working in this field at the present time possess all these characteristics and some of the time spent on the project necessarily has been devoted to the training of personnel. Heavy turnover of personnel has further complicated the problem of maintaining a staff that has the training and experience necessary to carry on the study.

Lack of cooperation on the part of some segments of the trade has caused considerable difficulty. Many members of the trade are hesitant to reveal information regarding the operation of their businesses. This hesitation may be due in part to the belief that the results of the findings might be disadvantageous to the trade, but it is also partially due to distrust of the researchers and fear that information regarding the operation of individual firms will be revealed. In the past, experiment station workers generally have not developed contacts with the cotton trade and buyers have no basis for judging the integrity of the workers. Work on the project thus far has demonstrated, however, that better cooperation can be obtained after the members of the trade and the workers become better acquainted. As the project has developed the researchers have become more familiar with their job, learned some

of the problems and the way of thinking of members of the trade, and are in a better position to explain the purposes of the work and to gain the confidence of the people being interviewed.

Some segments of the trade have also expressed skepticism as to the ability of researchers to be of practical aid in conducting their businesses. This skepticism has been partially overcome in those instances where trade representatives have been asked to *participate actively in the planning and development of the study*. These representatives have furnished suggestions which have made the results more useful to the trade and aided in securing better cooperation. Some workers on the project have expressed fears that this procedure would lead to trade domination and the use of the project as a propaganda weapon. Such developments as these must be guarded against but in the development of the cotton project thus far there has been no evidence that any segment of the trade has such inclinations.

Some of the important problems in developing the project which are related to its cooperative nature have already been mentioned. These include the difficulty of establishing administrative machinery, of determining the authority and responsibilities of members of the group, of obtaining uniform procedures in the several states, of keeping an agreed-upon time schedule. Considerable progress has been made toward the solution of administrative problems but questions still exist regarding certain phases which will require further consideration.

AGRICULTURAL MARKETING RESEARCH AT THE UNIVERSITY OF CHICAGO

O. H. BROWNLEE

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LIKE much of the current research in the marketing of agricultural products, the "Chicago project" is concerned with marketing efficiency. To be more specific, we are attempting to: (1) draw the outlines of a concept of marketing efficiency which is consistent with (and hence derived from) widely agreed objectives of economic policy; (2) apply this concept to a determination of the extent to which too few or too many resources are employed in producing marketing services; (3) identify the factors which tend to reduce the efficiency of the marketing system below its maximum (with given preferences and available resources and technology), noting particularly the influences which might be altered by public policy; and (4) describe (largely by means of statistical estimation) some of the relationships which are relevant for measuring efficiency and the importance of certain forces which influence it. In approaching this problem we hope to apply to marketing research those parts of economic theory which have proven useful in other areas of economic research. We also hope that, from our findings, hypotheses might be developed which may prove useful in research relating to sectors of the economy other than marketing.

In the following pages I shall try to make clear some of the basic assumptions underlying our analysis and describe in more detail parts of the project and some of the hypotheses which are being tested.

The Concept "Marketing Efficiency"

Any appraisal of economic institutions must be made with respect to some norm—an ideal situation or a set of situations which is considered to be the "best" of those situations which are possible. This ideal situation is derivable from (1) the value system of the society served by the institution being appraised, and (2) the beliefs (facts and things that pass for facts) describing the various situations which are possible.

The various possible production situations are definable given (1) the supplies of various resources and (2) the ways in which these resources can be converted into products. These two sets of

data delimit the various "production possibilities"—the various combinations of products which might be produced and thus the sacrifices of some products which might have to be made in order to secure more of others.

Assume that we can divide the products of the economy into

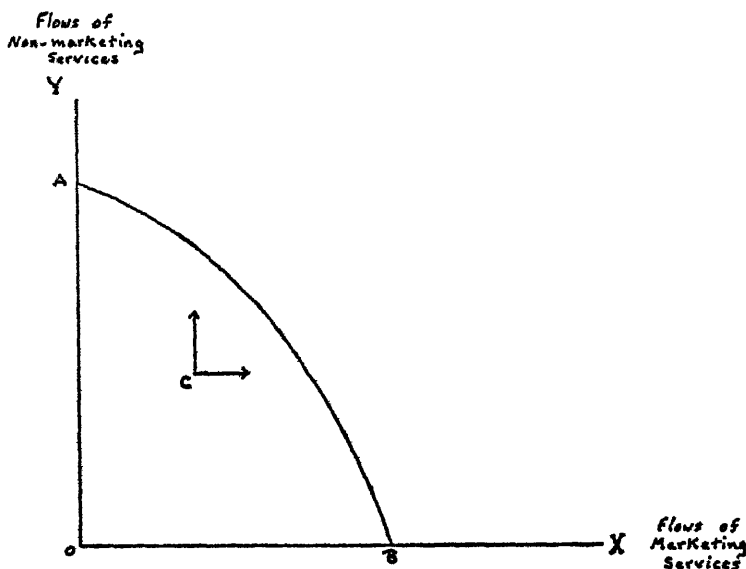


FIGURE 1

The points in the space OAB represent various "production possibilities." Any point on the line AB represents an efficient point in the sense that an increase in the flow of X cannot be obtained without a decrease in Y , and vice versa. At any interior point (say, point C), production of both X and Y could be expanded without any increase in the amount of resources used.

two classes—marketing services and non-marketing services (both commodities and services). With a given collection of resources and ways of converting resources into products, the set of "production possibilities" might be described as the convex set OAB in Figure 1. Any point in the space OAB represents a combination of the two classes of products which it is possible to produce. Any point not on the line AB —the boundary of the set—represents a situation in which more of one product could be produced *without* sacrifice of the other product, while a point on AB represents a situation in which some of one product *must be* sacrificed in order

to produce more of the other. The points on AB have thus been characterized as "efficient points."

Production of a combination of products which is not an element in the set of "efficient points" indicates that either (1) the best of available technologies is not being employed or (2) the combination of resources employed to produce a given amount of product is

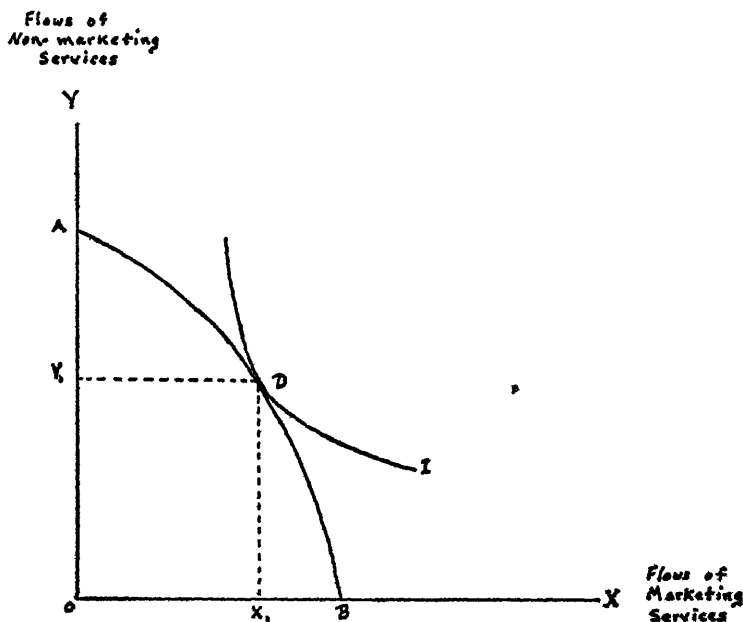


FIGURE 2

The curve AB is the same as that in Figure 1. The curve I represents combinations of X and Y which are equally satisfactory to the community as a whole with a given income distribution (see footnote 1). Hence D , where X_1 of marketing services and Y_1 of non-marketing services is being produced, represents a position of maximum welfare.

not optimal. An improvement in technology can be represented as a movement of the boundary away from the origin.

If we know consumer preferences and the "best" distribution of income, we can select a single element of the set of "efficient points" and denote this element as the best combination of products. This element will also be one in a subset of product combinations which are equally satisfactory to consumers—a "community indifference"

curve (see Figure 2).¹ Any departure from this element (represented as a point of tangency between the line AB and the "community indifference" curve) would indicate that, with the given preferences and income distribution, consumers had relatively too much of some products and too few of others compared with what they prefer and could be produced. Since the preferences of various consumers are not identical, the element which denotes the best position may differ with each income distribution, there being a different "community indifference" curve for each distribution of income. Rather than specifying a single income distribution and hence a single element in the set of production possibilities as "best," it probably is tactically desirable to consider each element corresponding to any income distribution as equally desirable and to thus define a set of best positions. Judgments regarding the "best" distribution of income are thus deferred to policy makers.

Given this set of best positions, the concept of efficiency is obvious. An economic system is as efficient as possible whenever the flows of products are those in this set. The degree of economic inefficiency is thus the degree of departure from this set.

Factors Accounting for Inefficiency in Production of Market Services

It appears highly unlikely that the firms producing marketing services are using the best technology or are using the optimum combinations of resources for producing the present flows of marketing services. In the language of the previous analysis, the present production situation probably can be represented by an interior point rather than an efficient point in the set of "production possibilities." However, when one compares the marketing sector with

¹ By a "community indifference" curve, I am referring to a curve showing the combinations of two commodities which will leave each member of the community indifferent as to which combination is available to the community as a whole. Assume, for example, a community composed of two individuals, A and B , and having available flows X_1 of commodity X , and Y_1 of commodity Y at its disposal. Assume further that A gets X_A of X and Y_A of Y thus making $X_B = X_1 - X_A$ and $Y_B = Y_1 - Y_A$ available for B . If the amount of X is reduced from X_1 to X_2 , Y must be increased so that A is as well off as he was with quantities X_A and Y_A and B is as well off as he was with quantities X_B and Y_B in order that the new situation be equivalent to the old. Community indifference curves may intersect, since if the initial distribution of X and Y between the individuals were different and the preferences of A and B are not the same, the amounts of Y required to leave them as well off after the reduction in X as they were before will differ (Refer to T. Scitovsky, "A Reconsideration of the Theory of Tariffs," *Review of Economic Studies*, IX: 89-110 (1942), for an example of the use of the community indifference concept.)

the rest of the economy and examines the factors which account for departures from the boundary points, it is my judgment that the bulk of the marketing sector of the economy will be appraised as relatively efficient.

Let me emphasize that the above judgment is a tentative one made without adequate empirical investigation. It is one of the hypotheses which we are testing. A test which would be unquestioned by most research workers would require knowledge of all relevant production functions (not only in marketing, but in the rest of the economy as well), resource supply functions, and consumer preference systems. In addition, it would require knowing how production decisions are made and whether they might be improved. Such knowledge, if attainable, obviously is beyond the range of this project. However, it is my belief that considerable progress can be made toward appraising the economic efficiency of various sectors of the economy through examining data which are already available and from which can be estimated such factors as rates of return to various resources in various uses, the movement of labor and capital between industries, comparative conditions of entry of new firms, differences in required labor skills, degrees of risk, and other relationships which will present at least a sketch of relative efficiencies of various industries.

My tentative judgment regarding the relative efficiency of the marketing system depends to some extent upon a modification of the previous definition of desirable situations to take into consideration lack of knowledge about the future and the kinds of changes which may occur in the data facing those who make production decisions. With any given initial situation, the set of possible situations at any time depends upon decisions made in the past by the various economic units in response to their expectations regarding the future. Other factors not subject to control, however, influence the positions which actually could be achieved. It is possible to select at the present time, from the set of expected possible situations for some given time in the future, a subset which can be considered as most desirable. When the given future time becomes the present, however, this subset may not be the one which is in fact most desirable. Nevertheless, with the knowledge available at the time when the decisions were made, any course of action other than that chosen would have been considered as leading to results inferior to those expected from following the course which was

selected. Consequently, unless we are to damn the system for failing to perform something which it may be incapable of performing, we must examine and appraise the way in which production decisions are made in the light of the information available to decision-makers.

Assume that my judgment about the production efficiency of the marketing system was confirmed. Then, aside from the errors resulting from lack of information relating to possible ways of producing—errors which could be reduced by more widespread dissemination of knowledge relating to technological possibilities—greater efficiency in marketing could be obtained largely through institutional modifications which would reduce uncertainty. Some of the modifications required would necessitate costs greater than those imposed by the uncertainty which they would reduce and hence would not be feasible. Others, however, appear to be achievable at relatively low costs.

Among the latter are modifications which would reduce the uncertainties imposed by inflation and depression. The flexibility which it is profitable for the firm to maintain in order to meet the wide variety of employment and price level conditions which have prevailed in the U.S. during the past three decades discourages long-term commitments of the kind which would increase economic efficiency. While this is not the appropriate place to debate which measures relating to the stabilization of such variables as the general level of prices or unemployment should be used, it can be pointed out that such stabilization measures—whether they be flexible taxes, flexible wage rates or flexible government expenditures, for example—transfer the flexibility away from the firm to a part of the economy where the costs of achieving it may be considerably lower.

Reducing the variability in the supplies of certain agricultural products would reduce marketing costs both through its impact upon uncertainty and through the decrease in excess capacity of processing firms which it would permit. It is my judgment that costs of reducing the year to year variability in livestock supplies would be less than the reduction in processing costs which would result. The year to year fluctuations in livestock supplies are largely related to the variability in feed supplies—variability which could be reduced at relatively low costs by appropriate feed storage policies. Here, also, the flexibility which now must be achieved by the firm would be transferred to another sector of the economy—

the grain storage sector—where the costs may be relatively low.

Other potential institutional modifications which would reduce marketing costs include changes in labor arrangements within processing firms subject to wide variations in levels of operations. In particular, the range within which firms must operate in order to avoid paying overtime or for time not worked is too narrow, given the wide range of volume levels which may prevail and which cannot be accurately forecast. Modifications might be made which would not impose undue burdens upon labor yet would permit more efficient labor utilization.

*Inefficiency Resulting from the "Wrong"
Production Pattern*

A second class of divergences between actual and optimal conditions is the relative overproduction of some goods and services and underproduction of others. Although the assumptions underlying many of the current judgments are not clearly set forth, a basic one appears to be that too much marketing service is being produced; i.e. that if certain services were eliminated, marketing costs would fall enough to more than compensate the consumer (and also the farmer) for the loss of the service. This assumption may be correct for some marketing services. However, if applied to marketing as a whole, it appears to be in conflict with evidence gathered from analysis of family budget data which show that almost without exception, money expenditures upon a commodity rise proportionately more with increases in income than do the physical quantities consumed. Increase in money expenditure with physical quantity held constant reflects an increase in "quality" of the product as well as an increase in processing and in other marketing services. However, in cases where there were no apparent quality changes, most elasticities of expenditures have exceeded the corresponding elasticities of physical quantities.

While this evidence is not definitive, it suggests that marketing is a part of the economy which will grow relative to that part which produces the raw materials, because consumers prefer to add services as they get richer. Examination of the trend of shares of the national income attributable to various sections of the economy adds confidence to this forecast. Reducing the amount of services might lead to reductions rather than increases in marketing efficiency.

There may be factors in the non-marketing sector which would

induce production of too many marketing services. As long as there is relatively "free" entry of firms into producing the various goods and services, the economic system contains a means more or less automatic which discourages long-run structural maladjustments of the kind that lead to overproduction of some things and underproduction of others. Much of the marketing sector of the economy is relatively easily entered. Capital requirements usually are not large compared with those in other industries. Hence, there is not likely to be underproduction of marketing services for any prolonged period of time.

Whether or not there is relative overproduction of marketing services under these conditions depends upon freedom of entry into other sectors of the economy. If entry conditions in some sectors are restricted, relatively too many resources may be forced into the "free" sectors. It has been argued that there are too many farmers and too many small retailers—foodstore operators, shopkeepers, and proprietors of filling stations being examples. While it is true that money returns to labor in these sectors have been relatively less than in most other sectors of the economy (excluding parts of agriculture), it does not necessarily follow that the real incomes of the supposed excess of these small entrepreneurs would be increased if they were to move elsewhere. Since 1943, adequate opportunities have been available for jobs in other parts of the economy. If there has not been sufficient movement to equalize money returns to comparable skills, there is a general presumption that non-monetary elements of income are relatively high in these areas. In any event, if corrective action is called for, it would appear to be of a kind which would reduce the degree of monopoly in the non-marketing sector of the economy.

Efficiency and Income Distribution

So far I have said nothing about the effects of the marketing system upon the distribution of income and have evaluated efficiency solely in terms of effects upon total income. In view of the fact that much of economic policy is designed to change the distribution of income from that which otherwise prevails and that most policy disagreements revolve around differences in judgments as to what the distribution of income should be, this omission may be considered a serious one. This is not the appropriate place to debate the merits of increasing or diminishing farmers' relative incomes by means of public policy. It can be demonstrated that—whatever is

decided as the "best" income distribution—using the marketing system (through its influence on price) as a means of achieving it is not appropriate in the sense that the total income to be distributed will be smaller than if direct taxation and subsidization is employed. Production possibilities will be more favorable (more of some commodities will be produced without sacrifices of other products) or the bundle of commodities produced will be more desirable, or both, if the direct methods are used. Thus, if it is believed that farmers should have larger incomes, a more appropriate device for making the change is a tax upon non-farmers, the proceeds being transferred to farmers.

Empirical Estimates Relating to Marketing Costs

The more intensive empirical work which we are undertaking is an attempt to estimate the effects of fluctuations in hog supplies upon pork processing costs. In this study we have been fortunate in securing the aid of managements of a few meat packing concerns in helping us to determine what factors are important and hence what things we should try to measure. One firm has given us detailed data from which we hope to estimate production functions for two plants—one in which supplies are relatively stable seasonally and one in which there are rather wide fluctuations both seasonally and annually. From these data we hope to be able to estimate the production functions for the two plants. Other costs—such as storage costs—can be estimated from aggregate data.

To date, we do not know what inferences we can make regarding the industry as a whole from the estimates which we might make. The similarities in technical processes used in hog slaughter by various firms comprising the bulk of the industry suggest fairly wide application of the results obtained from only one firm. However, there are difficulties in interpreting the statistical estimates which can be made from firms' cost data, unless one has considerable knowledge of the ways in which various production decisions are made. For example, it might be that the firm has too little (or too much) curing capacity; that it could improve its estimates of the time distribution of slaughter and thus reduce overtime and the employment of extra gangs. If any of these conditions hold, the observed cost at any level of slaughter cannot be considered as the minimum for this level. Nor can "mistakes" necessarily be considered as random deviations from the "true" function.

Any short-run savings from reducing the magnitude of fluctua-

tions in hog supplies would, on a *priori* grounds, be expected to be smaller than the long-run savings. The costs of changing the pattern of farrowings would be smaller in the long run (supply functions for the resources being more elastic) and the reduction in processing costs would be larger, there being an opportunity to adjust numbers and sizes of plants to the more stable supply situation. Thus, if short-run costs in a given plant could be reduced by X percent as a result of more stability in hog supplies, long-run costs should be reduced by more than X percent, since new plants could expect to operate within a narrower volume range.

Measuring these long-run cost differences, however, is even more difficult than measuring the short-run differences. It involves knowledge of technology applicable to livestock slaughter and the manufacture of pork products which may not have been known to many firms and which if known, may not have been applied in the construction of existing plant and equipment because of the variability in supplies.

As a first approximation, one might assume that the production function for the packing industry as a whole in the long run is such that a one percent increase in slaughter could be achieved by increasing the resources used by packing firms by one percent. If this were the case, long-run costs per unit need not exceed the minimum unit cost of any plant now in operation. Further knowledge regarding the potential technology of packing operations may reveal an even larger potential cost reduction than that which would be estimated by the procedure described above.

Along with the estimates of the changes in processing costs which would result from various changes in the variability of hog supplies, we are also attempting to estimate the changes in hog production costs which would accompany the changes in the time distribution of farrowings. Here, again, the estimates may not be sufficiently accurate because of the lack of adequate data. However, analysis of farm records and feeding experiments will yield some clues regarding these costs.

Measures to Reduce Supply Variations

If one knew accurately the magnitude of the costs imposed by hog supply fluctuations, he could determine whether it is desirable to suggest action which would reduce them, and if so, which of the various possible courses of action would be most desirable. There is

a general presumption that if the costs imposed by these fluctuations exceeds the cost of reducing them, some private economic units would take steps which would further reduce these variations. For example, it might be assumed that the normal seasonal pattern of hog prices portrays a combination of the costs of variations to processors and farm costs of farrowing hogs at various times. If the seasonal price movement were greater, the time distribution of farrowings would be more regular. But, packers would not save enough as a result to be able to pay the higher prices during what has been the low volume periods. This argument appears valid—assuming that both packers and farmers have complete information with respect to costs of these variations. Movement toward less seasonality in hog production during and immediately following the war suggests that farmers have overestimated the costs of reducing the variability in hog supplies and that the problem is largely one of providing them with adequate information. Evidence that meat packers have lost money, in the long-run, as a result of pork storage operations suggests that the seasonal price variation has been too small.

As indicated previously in this discussion, annual fluctuations in hog supplies appear to be closely related to fluctuations in supplies of feed grains. This is particularly true at the fringes of the Corn Belt. It is desirable that feed grain prices change with the availability of feed grains in order to encourage their efficient use. And little can be done about changing the weather to reduce yield variations. However, variations in the amount of feed stored is a way by which the fluctuations in crop production could be absorbed without equivalent fluctuations in livestock output. It appears that the function of storage in absorbing fluctuations in feed production has not been exploited as fully as would be most efficient from the standpoint of the economy as a whole. A relevant question is, "Why has not the private economy utilized storage as efficiently as is desirable?" Here, again, uncertainty with regard to prices may be an important factor. While there may be grounds for public action to help stabilize feed grain prices through a public storage program (perhaps the ever-normal granary) and through extension of credit to farmers to hold grain on farms when crops are above average, it seems reasonable that the private economy would utilize storage more effectively if the general level of prices were more stable.

I have tried to outline the basic presumptions (I hope they are not prejudices!) underlying our marketing research and the kinds of empirical estimates which we are attempting to make. To adequately test all of the hypotheses which will be suggested would require more resources than are available to our project. However, we hope that some of the questions we will unearth will prove of interest to other research workers and that some of our procedures will have an application to problems other than those which we are attempting to solve.

DISCUSSION

BENNETT S. WHITE

Bureau of Agricultural Economics

Around the Department we include studies such as we have had presented here in the general category of costs and margins work. As I see it, the job of the marketing economist working in the margins and costs field, and the objective of margins and costs studies is to supply the facts, which are now largely lacking, with respect to what marketing margins and charges are, what services they pay for, how these services are performed, and what might be done to reduce their cost. On the basis of the facts which he finds and the analyses which he makes, intelligent policies and programs can be formulated. Marketing economists are under tremendous pressure to do this job and to do it quickly, and I am inclined to believe that studies in the cost and margin field constitute the heart of the RMA program.

Dr. Young's study of milk marketing costs and efficiency in New York City is one of the most extensive and thoroughgoing studies of its kind. I do not believe that economists have as yet devised a satisfactory basis for segregating the cost of performing an operation with respect to a particular commodity or service when the same resource or resources are utilized to produce a number of goods or services. This, of course, is the familiar problem of joint costs. As Dr. Young says, the combination of functional cost accounting on a uniform basis, time and motion studies, and market analysis provide the basis for a searching out of those methods, practices and services which account for the various marketing charges. In addition, by indicating differences in cost and efficiency between the various individual firms, his study shows how it should be possible for all participants in the spread to emulate the most efficient practices and methods which are now in operation.

The North Central egg project discussed by Mr. Miller represents a successful effort to coordinate the resources and interests of a number of states and federal agencies in the achievement of limited objectives. This study should provide a valuable basis for further work which should include demand studies designed to measure the breadth of the market for

eggs of improved quality, and other studies in which price premiums and increased incomes to producers arising out of the marketing of better eggs may be compared with the additional costs involved in effecting quality improvements.

The cotton project discussed by Mr. Faught portrays the difficulties involved in coordinating and bringing to bear the efforts of a large number of states in an attack on the marketing problems of a commodity which has a complicated marketing system. The experience of this group indicates that the oft-criticized descriptive type of marketing study is frequently necessary as a preliminary step to the delineation of marketing problems and the development of methodology for undertaking research on them.

The paper presented by Mr. Brownlee is one of a number of studies which the Bureau of Agricultural Economics is sponsoring at universities and private research institutions. Some of us feel that problems dealing with pricing, the allocation of resources, and the over-all effectiveness of the marketing mechanism are likely to receive too little attention as compared with specific studies of particular commodities, agencies and functions. I think that Mr. Brownlee's work to date illustrates that general theoretical formulations of concepts and objectives relating to marketing efficiency may not be so difficult. However, testing hypotheses requires the making of empirical studies of particular industries, functions, and institutions which involve him in difficulties of generalizing or "adding up" which are similar to the problems many of the rest of us meet when conducting studies with more limited objectives.

Let me now mention a few points more specifically concerned with the current meaning and future effects of studies such as have been considered today.

As far as the current situation is concerned, I think that there is little doubt but that the studies under way can be completed and people will gladly receive them and read them. Even the studies which do not go beyond measuring margins will have a decided educational value. We have observed that some groups are interested in having us carry on margins and costs studies as rapidly as possible along the broadest possible front, because they expect the studies to show gross inefficiencies or exorbitant profits in the marketing of farm products. On the other hand, some middlemen and their representatives are urging that margins and costs work be expanded and speeded up for an entirely different reason. They obviously are expecting that our studies will indicate that marketing processes are not over-costly in relation to cost rates for the factors of production and methods and processes available and that profits are not unreasonably high.

When we come to future usefulness and ultimate effects of cost and margin studies, I think that we are on less certain ground, and a considerable diversity of opinion prevails. For my part, I am guardedly or conditionally optimistic. It seems to me that there are two big questions. First, is it feasible and practicable on the basis of existing conditions to make comprehensive studies of what marketing charges and costs are and what might be done to reduce them for all or most of the major agricultural

marketing industries? This is going to be a formidable task if we go into it. We are just making a start. The field is comparatively new. In some cases techniques have to be worked out as we go. Industry cooperation is a problem. All of this takes time, and yet we are being constantly urged to get quick results. Furthermore, the cost will be considerable. If we are to proceed with these studies, we must have the patience, cooperation, and support of those who are interested in research designed to provide the basis for making marketing more efficient.

The second big question, it seems to me, is: Will the results of the studies be used? That is, in the longer run, will cost and margin analyses actually result in a reduction in marketing costs? Since margins and cost research is not intended to provide the basis for government control and regulation, we must depend upon private enterprise to apply the results of research. This means that business men must be possessed of the enterprise and incentives necessary to effect the economies and make the improvements in efficiency which research studies indicate are possible.

I believe that those who entertain the view that agricultural marketing costs can be substantially and quickly reduced for a wide range of commodities are doomed to disappointment. Consumers are demanding more and more services. I am aware that this is entirely aside from the concept of efficiency as such, which assumes that marketing services remain the same. However, the fact of the matter is that many people expect marketing research to result in an actual decline in the spread between producer and consumer. If, as it seems reasonable to believe, standards of living continue to rise, consumers can be expected to demand more rather than fewer services, and this will work against any reduction in marketing margins and costs. In fact, some of the marketing research under way at the present time, while it may be effective in demand creation, can be expected to increase rather than decrease marketing costs.

In the second place, well over half of the marketing charges for agricultural commodities are accounted for by wage payments. Wages have risen sharply in recent years and certainly cannot be expected to undergo any general decline. Not only are wages to remain high, but there is sometimes resistance to the introduction of labor-saving machinery and to changes in methods and practices because of loss of jobs for wage earners directly affected. This introduces the problem of the opposition of vested interests to changes in marketing methods and channels, which is, of course, much broader than labor and wages. This in turn brings up questions of price policy, the extent to which competition prevails, the rigidity of marketing institutions, government programs in the marketing field, etc. In my opinion, work along this line needs to be considerably expanded. It is extremely difficult, but results might be proportionately great. Research which points the way to methods, practices, processes and channels which would provide for lower costs and increased efficiency will be of little use if the institutional structure of the marketing system, price policies of private business, government programs, and related factors interfere with the application of the results of research.

The actual showing which research may be expected to make will also be related to general business conditions and price levels. It is a well-established fact that cost factors entering into marketing charges are relatively rigid and do not fluctuate in response to changes in the demand for and supply of agricultural commodities. As you know, there is a close correlation between the level of agricultural prices and the share of the consumer's dollar received by the farmer. A period of sharp decline or prolonged low prices for farm products would be certain to bring a marked decrease in the share of the consumer's dollar received by farmers, notwithstanding increases in marketing efficiency.

However, I think we are still justified in believing that studies designed to provide the basis for improving the efficiency and reducing the costs of agricultural marketing are very worthwhile. I think we are justified in believing that obtaining and disseminating the facts on marketing costs, in time, will make a significant contribution to lowering marketing costs more than otherwise would be the case.

CURRENT STATUS OF MARKETING AGREEMENTS FOR FRUITS AND VEGETABLES

S. R. SMITH

Production and Marketing Administration

THE Marketing Agreement Act of 1937 administered by the Production and Marketing Administration of the United States Department of Agriculture authorizes the use of marketing agreements and orders in handling enumerated products (including fruits and vegetables) in interstate or foreign commerce. The act has three specific objectives: To raise prices to or maintain them at parity; to protect consumers by authorizing no regulation designed to raise prices once parity levels have been reached; and to maintain minimum standards of quality and maturity.

Agreements and Orders

A marketing agreement is a contract between the Secretary of Agriculture and the handlers of any farm product. Authorized actions pursuant to agreements and orders are protected against anti-trust prosecution for combination or conspiracy.

A marketing order binds all handlers operating in specified production and marketing areas to adhere to its terms. Orders may be applied to milk and its products; to fruits and vegetables, except for canning or freezing—with a few exceptions; certain nuts; tobacco; soybeans; hops; and the products of these commodities, also naval stores and honey bees. Orders applicable to fruits and vegetables may provide methods for limiting shipments by grade, size, quality, maturity, and pack in specified markets for specified periods; for allotting purchases and sales by handlers; for surplus and reserve pools; for inspection; for defining and prohibiting unfair practices or methods of competition; for selection of administrative agencies; and for such other items as are necessary to administer the order.

Both agreements and orders—except for milk, which is not discussed here—apply only to handlers and not to producers or retailers.

Formulation

The Secretary may initiate proceedings, but usually a tentative agreement and order is formulated by industry groups, submitted

for preliminary approval to the Production and Marketing Administration, and then discussed in detail at public hearings which are conducted much like courts. Upon conclusion of hearings and with time allowed for briefs and exceptions to be filed, the Assistant Administrator of the Production and Marketing Administration and the Secretary of Agriculture must both approve the proposal on the basis of evidence in the hearings record.

Agreements become effective when in the judgment of the Secretary sufficient handlers have signed them. A proposed order, which must parallel an agreement on which hearings have been held, becomes effective when the Secretary finds from the record that it will effectuate the objective of the Act; that the production area is as small as practicable; that different production and marketing conditions among different districts of the production area are recognized in different provisions; and that after submitting the order to referendum of producers, (a) it is approved by two-thirds of voting growers by number or volume of production and the parallel agreement is approved by handlers of at least half the regulated volume, or (b) handlers have not approved a parallel agreement but at least two thirds of growers by number or volume have approved the order. Additional requirements are that the order will effectuate the purposes of the act and that there are no other feasible means of accomplishing such purposes. Programs are thus formulated by the industry; proposals are carefully appraised by the Department; all interested groups have a voice at hearings and the industry approves the program.

Development of the Statute and the Programs

Only four short provisions relevant to market control were included in the Agricultural Adjustment Act of 1933; namely, (1) the Secretary could enter into agreements, the terms of which were not specified, with handlers of any farm product to control its interstate or foreign movement; (2) he could impose licenses, the terms of which were not specified, upon any or all handlers to prohibit charges or practices which prevented recovery; (3) he could require maintenance and disclosure of books and records as necessary; (4) he could avail himself of the investigatory powers of the Federal Trade Commission in inquiring into compliance. Including milk, 68 programs using licenses were formulated. Thirty programs for fruits and vegetables were developed, the production

areas being heavily localized in specialty areas on the Pacific coast and in the Southeastern States. Twenty-two programs were still operating in 1935. Nine are still operating and some of them have functioned continuously.

Experience with agreements and licenses indicated that programs should be confined to areas as small as practicable in order to maintain homogeneity of interests, to facilitate local administration, to prevent regional or Nation-wide monopoly, to eliminate problems of interregional equities, and to make adjustment to local differences in production and marketing conditions. License programs have been attacked in courts in cases which alleged failure to adhere to due process of law, incursion into intrastate trade, delegation of legislative powers without adequate administrative standards, and invalid delegation of executive authority to control committees. As a result, most of the safeguards in the present Act were introduced in 1935, such as: substitution of orders enforced by courts for licenses which could be revoked; applicability of orders to enumerated commodities only; provisions for assessment and enforcement; establishment of committees as agents of the Secretary, in whom all executive authority was vested; provision for modification, review, or exemption from findings or penalties; authorized integration with state and with other Federal programs; specification of parity price as the objective and upper limit for programs; procedure for notice and hearings; definition of commerce to be regulated; restriction of terms in orders to enumerated provisions; essential identity of an order with an agreement on which hearings had been held; careful specification of conditions for approval, effectuation, and termination.

When the processing-taxes section of the Agricultural Adjustment Act was declared unconstitutional in 1936, the market control sections could remain effective only if separated from the production phases of the act. The agreements and orders provisions were therefore separately reenacted as the Agricultural Marketing Agreement Act of 1937. In 1947, one major amendment added the maintenance of standards of quality in the public interest as one of the three objectives and thus made it possible for grade and size programs not designed to raise prices to be operated without reference to the parity standard. The act is a permanent statute independent of relief or adjustment objectives.

Use of Marketing Orders

Since 1935, orders have been promulgated for bees, cauliflower, celery, citrus fruits, grapes, hops, melons, onions, peaches, pears, plums, lettuce, peas, potatoes, fresh prunes, tomatoes, and walnuts. Forty-seven orders have been issued for 37 production areas. Nine have governed more than one commodity. Eight orders have been effectuated without a parallel marketing agreement. No marketing agreements have been made effective without a parallel order.

In early August of 1949 there were 22 fruit and vegetable programs in operation and several others were being formulated. Four cover citrus fruits, eight are for deciduous fruits, one is for vegetables, seven for potatoes, one for walnuts, and one for hops. Three programs regulated more than one commodity, which is done only when the products are related, when most growers produce more than one and when the cost of operation can be reduced. Twelve production areas are on the Pacific Coast, four in the mountain States, three in the Southeast, and three potato orders in the central States and Maine. Eleven programs include more than one state. For citrus fruits nearly the whole domestic supply is covered. Thirteen orders authorize different regulations for different parts of the production area. Thirteen permit different regulations for different varieties.

Nearly any commerce now burdens, obstructs, or affects the flow of trade among the states or with foreign nations. However, several orders restrict regulations to the United States and Canada; a few are applicable only to continental United States, Alaska, and Canada, but in general interstate and foreign trade may be controlled. Six orders provide for different regulations to different parts of the market areas. Five orders date back to 1933. Most have operated more than 10 years. One-third have been amended. Most of them have weathered a depression, a recovery, a recession, a war boom, postwar inflation, and the present readjustment. The life and stability of these programs indicate that properly formulated and applied, and well-administered, they can benefit producers without damage to other groups.

Nearly two-thirds of a billion dollars of annual production is now regulated by fruit and vegetable orders. Nine programs affected more than 5,000 producers each, the farm value of their annual production ranging from \$25,000,000 to \$90,000,000.

Administrative Agencies

The ultimate goal of producer welfare is the reason that most control committees are weighted heavily with grower representation. The need to recognize handler interests and to utilize their skills results in inclusion of handlers either as voting members or as advisers to grower committees in most programs. Final authority rests with the Secretary, to whom committees *recommend* specific regulations for clearly defined markets and periods by the methods authorized in the orders. The Secretary has broad powers. He chooses committee members from nominees selected by the industry; designates agents to act for him and all acts of committees must be approved by him or his agent to become binding; he may remove any officer; suspend or revoke any regulation; he must approve budgets and assessments; he may substitute another agency for the committees; he may suspend all or part of a program if it does not contribute to the objective of the act. Nothing in an order may limit the rights of the Secretary to intervene. As a result, no committee member is held personally liable for actions under the order except those actions involving dishonesty, willful misconduct, or gross negligence.

Thirteen orders provide for a single administrative committee although informal subcommittees may be established. Six programs provide for handler advisory committees and two orders establish district advisory committees to assist in formulating regulations, but not to vote on them. Four provide for district committees to formulate district regulations subject to disapproval by the area committee. Membership ranges from six to 25 persons. Five committees are composed of growers only. Growers are given one vote each in one district in choosing nominees. Handlers vote for handler-members either personally or by relative volume of business.

At least a full majority of the committee is required to forward a recommendation to the Secretary. Some orders require a two-thirds vote. Membership is distributed by districts and by affiliation, with a neutral member sometimes included, to prevent any single faction of an industry from controlling either affirmative or negative action.

All committees are empowered to administer the order, to investigate violations, and to recommend amendments. They are

required to mediate between growers, handlers, and the Secretary; to keep books available to the Secretary; to analyze growing and marketing conditions; to make audits; appoint employees; to give notice of meetings, regulations, and policies; and to provide information requested by the Secretary. Some committees must publish monthly statements, make crop estimates, recommend changes in election or prorate districts, announce opening and closing dates for shipping, consult with other committees, undertake research or service work, or delegate limited authority to employees. Nineteen committees must promulgate, in advance of issuing regulations, a detailed shipment policy which will permit growers and handlers to adjust their operations to the contemplated regulations. Recommended regulations must be in accord with standards set out in the order and with the advance marketing policy, valid with respect to the act and consistent with its objective and in each case supported by data and analyses. Activities of committees are further governed by requirements of the Administrative Procedure Act, Department regulations published in the Code of Federal Regulations and committee bylaws.

The Secretary may authorize committees to collect uniform assessments for expenses which are reasonable and likely to be incurred, in accordance with an advance budget approved by the Secretary. Funds may be used only for purposes authorized by the order and such uses must be approved by the Secretary. Excess funds are either credited to handlers' accounts or returned to handlers at the end of each marketing season.

Methods of Regulation

No court decisions indicate precisely the scope of regulation which may be permitted under the broad provisions of the act. Many different methods have been used, but most of them may be classified within a few major types, namely: (a) *Regulation of quality*. This is usually accomplished by specifying the grades and sizes of the product which may be shipped to market. (b) *Regulation of quantity*. This method of regulation involves the establishment of the quantity of the product which may be shipped to market during any specified period. The total quantity is allocated among all handlers on the basis either of past performance of handlers or the amount of product each handler has available for

current shipment. (c) *Reserve pools*. This involves the establishment of a reserve pool of the product, and the equitable distribution of returns derived from the sale thereof. (d) *Surplus control*. This involves determining the extent of a surplus, providing for the control and disposition thereof, and equalizing the burden of surplus elimination among producers and handlers. (e) *Unfair trade practices*. A method may be provided for prohibiting unfair methods of competition and unfair trade practices in the handling of agricultural commodities. (f) *Price posting*. This involves the requirement that handlers file their selling prices, and such handlers are not permitted to sell at prices lower than such prices as filed. Handler may change the prices at any time, but adequate notice must be given thereof.

Limitation of shipments to particular grades and sizes has been authorized in 30 programs and 13 have provided for minimum standards. Two each have authorized limitation by grade only or by size only. Two each have provided for minimum quality and for minimum maturity and one has specified pack requirements. Seven have authorized control over rate of flow to market, two of these specifying daily control and four authorizing shipping or loading holidays. Six orders have provided for diversion to secondary outlets. One program provided for price posting, and two have defined and prohibited unfair practices and methods of competition.

Trade channels, trade areas, or outlets other than those specified are exempted from regulation. Fruits and vegetables for canning or freezing cannot be regulated by Federal orders, except for asparagus and olives. Charity, relief, express, parcel post, and minimum-volume shipments are usually exempted.

All orders require reports as requested by the committee or Secretary in order to check compliance, the fulfillment of the objectives of the Act, and the degree to which antitrust exemption is abused. Most of them require manifest reports with detailed information on each shipment. Standard forms are provided and the extent and frequency of reporting are minimized. Confidential matter is carefully protected against disclosure, by the law, by the terms of the orders, and by the regulations of the Department.

Enforcement

Three methods are authorized in the act: Civil damages triple

the value of overshipment; restraining orders or injunctions; fines of \$50 to \$500 after conviction in a criminal action. Most cases in recent years are outright violations and the infrequent fruit and vegetable action is usually prosecuted under the criminal-penalty section. Any handler may petition for relief from any order or regulation. While the petition is pending, he is protected against criminal prosecution. Procedure is outlined in detail for handling such petitions and for appeal to the courts from the decision of the Secretary. The agreements and orders programs are protected against whimsical or capricious administration by any person at all stages from formulation through the issuance of regulations by the Secretary.

Procedure for amendment is much the same as for formulation, except that less time for notice may be required.

All, or any provision, of an order must be terminated if the Secretary finds that it does not contribute toward the objective of the act. No regulation designed to raise prices above parity can be issued. On petition of producers of at least 50 percent of regulated volume, the Secretary must terminate the program at the end of the current season. Benefits, privileges, and immunities terminate then, except for acts committed during the operation of the programs. The administrative committees become trustees and liquidate the assets of terminated programs.

Summary

Agreements bind only signers and therefore are not effectuated unless parallel orders binding on all handlers are issued. Procedure for operations from initiation through formulation, effectuation, and issuance of regulation are specified in detail in law and in published regulations. Orders are applicable only to specified commodities and channels of sale. They may contain terms which have been used mostly for limitation of shipments to particular grades and sizes; minimum standards; rate of flow control; and surplus or diversion control. Agreements are effective as declared by the Secretary. Orders must be approved by the large majority of growers and usually by handlers. More than 60 programs have been effectuated since 1933. Twenty-two orders now govern marketing of an annual output of fruits and vegetables valued at about \$650,000,000. Grade-size control is most frequently used since it is equitable, easy to administer, and effective. Exemption clauses

prevent hardship to individuals or regions. Except for two western citrus industries, rate of flow control is used as an auxiliary to grade-size regulation. This method requires careful proration and provision for adjustment of allotment. Surplus control devices are used mainly for such products as nuts and hops. In general, the long life of these programs indicates that they are effective—when properly applied and administrated—in maintaining and establishing incomes to growers in the interests of the general welfare.

FLORIDA CITRUS AGREEMENT

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A DISCUSSION of the Florida Citrus Agreement should be prefaced with a brief account of the operations of the Florida Citrus Growers' Clearing House Association, because the pattern of government regulations was foreshadowed by this organization. The Florida Citrus Growers' Clearing House Association was incorporated under the cooperative statute of Florida and conformed to the Capper-Volstead Act. Federal and state agricultural workers, commercial people from within and outside the state, and growers all had a hand in its organization. However, as early as 1888, long before people outside the state became interested in the Clearing House idea, and from time to time after this date, the *Proceedings of the Florida Horticulture Society* refers to the desirability of a citrus czar, or an over-all organization, or some government program that would enable the industry to control itself. The objectives of the Florida Citrus Growers' Clearing House Association were:

1. Standardizing of grade and pack.
2. Prohibit movement in interstate commerce of poor grades and sizes.
3. Regulate weekly shipments to insure an orderly time distribution.
4. Regulate shipments to auction markets to insure an orderly place distribution.
5. Advertise.
6. Minimum prices or a floor under prices which would at least return cost of production to efficient producers.

The standardization of grade and pack program accomplished much and a good beginning was made in advertising.

Regulation of shipments to market and proration to auction markets failed for three reasons. First, those firms outside the Clearing House nullified the efforts of those firms in the Clearing House by increasing their shipments when the Clearing House decreased the shipments of its members. During one allotment period the 20 percent outside the Clearing House shipped 50 percent of the fruit. Second, when the non-members persisted in overshipping, members began to violate their allotments because they felt that they were left holding the bag for the non-members. Third, no equitable method of making allotments was ever developed.

The Clearing House never marketed or had direct control over a box of fruit. It attempted to achieve its objective by controlling the marketing firms.

Although at one time 80 percent of the Florida citrus crop was handled by firms affiliated with the Clearing House, it was short lived, operating from the beginning of the 1928-29 season to the Fall of 1933.

When Federal statute provided for a means of bringing the entire industry under control it was immediately endorsed by those who had supported the Clearing House movement as a method of accomplishing, with Federal law, what the industry for four years had failed to do on a voluntary basis.

On May 8, 1936, Marketing Agreement No. 64 became effective. This agreement provided for regulation of weekly shipments and grade and size restrictions. No provision was made for proration to auction as was the case in License No. 95. The basis of making allotments was changed from past performance to an option of past performance or current control. This agreement was thrown out by Federal Court order in 1937 after operating less than a season.

Order No. 33 Covering Florida Citrus Fruit

Since February 22, 1939, the Florida citrus industry has been covered by Federal Order No. 33, which is a grade and size regulation. The experience of two agreements providing for regulation of weekly shipment had convinced Federal authorities that conditions in the industry were not conducive to a volume regulation. Because many growers will not enter into an agreement with marketing firms to handle their crop before the season opens there is no way of making allotments on the basis of current control. Federal authorities have, I believe, held to the opinion that there has not been an equitable method of making allotments, except on the basis of current control. It is of interest that Order No. 33 dropped both weekly volume regulation and auction prorate, leaving only grade and size regulations. However, in 1946 the order was amended to provide for shipping holidays during the period December 20 to January 20. But no more than two holiday regulation periods may be instituted in a season and then for not more than a total of fourteen days. By this amendment a step back to the regulation of volume was taken, although it was rather minor. The shipping

holiday is of questionable value. If the trade anticipates a holiday regulation, they are likely to buy enough supplies to carry them through the holiday.

Since the order became effective, a period of little over 10 years, there has been 168 orange, 159 temple orange, 114 grapefruit and 84 tangerine grade and size regulations instituted. In addition, there have been four or five periods when all shipments of certain varieties were prohibited.

Regulations have varied in length from a few days to several weeks and have averaged about two weeks. Some regulations have been very restrictive prohibiting perhaps for some marketing periods 25 to 40 percent of the fruit harvested from moving to the market. Other regulations have restricted only a very small percent of the crop from moving.

The order is administered by eight growers, composing the Growers' Administrative Committee and eight shippers, composing the Shippers' Advisory Committee. Members of these committees are nominated by the industry and appointed by the Secretary.

Benefits of the Program

One of the objectives of the program has been to maintain a uniform high grade of product on the fresh market. It is the general opinion of the industry, in which I concur, that considerable has been accomplished in this field. Certainly some low grade fruit has been kept off the fresh market and diverted to the processed market. It does not follow that the processed product has been hurt as a result of this, because citrus fruits which are considered poor quality for the fresh market may be very good quality for processing purposes. A second benefit of the agreement has been that of excluding any grade or size fruit when the committee believed it would return red ink to growers. This relieves to some extent the burden of marketing cost placed on good grade fruit by tie-in sales when poor grades return red ink. Because growers object to close grading, which increases the cull pile, and because of the necessity of obtaining large volume for economic operations, any account sale handler is apt, perhaps unconsciously, to resort to the practice of tie-in sales.

Another benefit is the development of statistics which the industry needs in its operations. Statistics obtained for developing its marketing agreement policy are the only authentic data available

which indicates the quality of the crop at the beginning of the season. Throughout the season data are compiled by weeks which show prices by sizes and grades.

An important benefit of the program is the bringing together from time to time representatives of growers and shippers to study the marketing problems of the industry. These committees have gained considerable prestige which make them important factors in steering the industry along practical lines. This benefit is more far reaching than the interchange of ideas between the two committees and their alternates. Anyone in the industry may be heard while the committee is in session, or, as often is the case, industry people express their views to their committee representative before action is taken. Perhaps the greatest educational value comes from the contact of industry people with their committee representative. Here committee members pass on to the laymen the thinking and reasoning of the committee. When education is tied to price or profit as is the case here, it speeds up the learning process.

The benefit from the study of industry marketing problems is of course centered in the formulation of a marketing policy to be followed during the season. In some cases committee members are inclined to leave too much of this to the manager. The members should devote more of their own time in developing this marketing policy. In addition to the marketing policy formulated at the beginning of the season, marketing problems must be continually studied in light of ever changing conditions before recommendation for regulations are made. This necessarily requires a study of past regulations and an appraisal of the current regulations. A desirable feature of the Florida agreement is that regulations are subject to change upon the recommendation of the committees.

Changing Conditions in the Industry

Three marked changes have taken place in the citrus industry since the order regulating Florida citrus was instituted in 1939. First, Florida grapefruit production has doubled and orange production has more than doubled. Second, there has been a large increase in the percent of the orange crop processed. In 1939-40 season, only 13 percent of the oranges were processed, in 1947-48 season 50 percent were processed. It is believed that two-thirds to three-fourths of the crop may soon be processed. Apparently there will be frozen concentrate capacity in the state to handle 20,000,000

boxes of oranges, or one-third of the crop this year. Cannery capacity is enough to easily handle a third of the crop. This change in the form in which fruit is being marketed is particularly significant since the present marketing agreement does not cover processors. Should 75 or 80 percent of the fruit go to market in processed form it may reverse the customary packing house operation. It is possible that with 75 percent of the fruit going to the processed market the fruit for the fresh market will be sorted out from the processed fruit at the processing plant. The third condition is the rapid rise and decline of the Texas industry, which may be temporary, and the failure of the California industry to hold the dominant place which it held for over 50 years.

Agreement Still Effective

It is usually assumed that the most effective regulations under Order 33 are those covering tangerines. The reason for this assumption is that Florida has no competitors in tangerines and any restriction of undesirable grades or sizes on the part of the Florida industry will not be replaced by additional supplies of low grades and poor sizes from other areas. In addition, a small percent of the tangerines are processed, hence those tangerines restricted by regulation do not later appear on the market in processed form to compete with the fresh product. While these two things are true this should not necessarily mean that benefit from orange or grapefruit regulation may not be fully as profitable as tangerines. Where regulations are highly restrictive as when a large part of the product is diverted to processed form, it makes possible confining to the fresh market only the high quality part of the crop. This should aid in making advertising more effective and simplify the marketing operation because handling many grades and sizes is expensive and may be confusing to consumers. The process does not go so far as to not allow consumers a choice. Where a regulation is carried to this point, a part of the fresh market may be lost. Actually, before we can know that our regulations are on firm ground, additional research is needed in the over-all field of demand, particularly at the retail level.

It has been suggested that in addition to regulations the program serves a useful purpose in that it supplies a great deal of useful statistical data and is a basis of stimulating study by industry people of their marketing problems.

The Florida citrus industry, in general, is decidedly of the opinion that the present program is serving a useful purpose through its grade and size regulations, but, at the same time, it is convinced that the program is not adequate. Certainly a sizeable part of the industry believes that weekly volume regulations, with proration to auction markets, are desirable. A considerable segment of the industry believes that processors also should be controlled, although, it is difficult to advance a good reason for controlling processors where only grade and sizes are regulated. Those who advocate bringing the processor under the program are usually thinking of a program that would provide for allotments of oranges to certain uses such as fresh use, processed use, and possibly for cow feed. But with the rapid changes taking place in the processing field this would be a mistake.

If a method could be developed for maintaining equity between handlers with volume regulation it would be almost universally accepted. Notwithstanding the failures of volume regulation in the past, once without government participation, and twice with government participation, the citrus industry, for over a year, has been perfecting an organization (Florida Citrus Mutual) under which it hopes to achieve, among other things, volume regulation.

According to a press report of July 23, 1949, Florida Citrus Mutual intends to institute a program of volume regulations as well as some other activities which if not identical with the activities of the old Clearing House are very similar to them. The program for the 1949-50 season as announced by the board of directors is:

1. "Establish minimum prices for fruit utilized by canning and concentrate plants.
2. "Regulation of volume of fresh fruit shipments, with weekly allotments to shippers on a past performance basis, adjusted as crop conditions may warrant.
3. "Establishment of minimum price on F.O.B. sales of fresh fruit whenever such minimum prices are necessary to stabilize marketing conditions and to achieve a more orderly distribution.
4. "Allotment of fresh fruit shipments to metropolitan areas, whenever such allotment becomes necessary with allotments to shipper, recognizing their historical position in such markets."

Florida Citrus Mutual is reported to have 80 percent of the fruit under contract for 1949-50 season.

Among the directors of Florida Citrus Mutual are people who

have served on the administrative committees of Order 33 and others who were closely affiliated with the activities of the Florida Citrus Growers' Clearing House Association. At least some of these directors are aware that the week-to-week shipments of Florida oranges over a period of years have not deviated from the average any more than the weekly shipments have from California. In the face of all the evidence about volume regulation and the experience of the past, the Florida citrus industry believes that something should be done about controlling the industry in addition to grade and size regulation.

The activities of the Florida Citrus Growers' Clearing House Association and the plans of Florida Citrus Mutual have been injected in this discussion to show the interest the industry has in industry programs. Most industry people feel that certain controls are necessary. They would prefer to have these controls without government participation, but most commodity controls are ineffective unless there is complete industry concurrence, rarely achieved without government participation.

Industry people are also inclined to rely on a governmental program or programs to cure all their ills. The biggest problem that an individual grower or individual firm has is meeting the competition of his neighbors. Likewise the biggest problem that one segment of an industry has is the meeting of the competition of other areas. Government programs should not attempt, through subsidy or otherwise, to eliminate this competitive element in our economy.

MAINE POTATO MARKETING AGREEMENT AND ORDER

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THE Maine Agreement No. 108 and Order No. 87 became effective November 15, 1948 and continued until June 30, 1949. Establishment of the agreement and order followed the usual procedure outlined by the Secretary of Agriculture. The program in Maine covered the entire state rather than any area or areas of concentrated production of potatoes. Over 90 percent of the handlers of this commodity voted for its adoption.

Specifically the marketing agreement and order stated that no handler of potatoes could ship any table stock potatoes of a variety or varieties of potatoes other than the Bliss Triumph variety, unless such potatoes met the requirements of U.S. No. 1 or better grade, and were not less than $2\frac{1}{4}$ inches nor more than 4 inches in diameter. The foregoing limitations on shipments of Maine table stock potatoes were not applicable to shipments of potatoes for export, or shipments in connection with government price support programs.

The order was administered by a committee of eight members, consisting of five producers and three shippers or handlers of potatoes. An equal number of alternate members were selected and served when regular members could not attend. The members and alternates were selected to represent each important potato production area in the state. The term of office of each member and alternate was one year. The duties of this committee were to serve as intermediary between the Secretary of Agriculture and any producer or handler of potatoes in carrying out the marketing agreement and order. Assessments were made against all rail and truck shipments to defray the expense of carrying out this program. All assessments above actual expenditures were refunded or credited on a prorata basis to all handlers. This meant keeping separate assessment accounts for nearly 2,000 handlers of potatoes.

The program in Maine started with very little opposition. There were only seven handlers who took active opposition to the program, some of whom were also growers. In mid-marketing season, about February, all the handlers had withdrawn their respective

petitions and requested dismissal of their cases. Thus the program was received and carried out with little opposition.

One year's experience with the potato marketing agreement and order in Maine is insufficient to draw definite and final conclusions. However, the past season's experience furnishes some indication of the desirable and undesirable features of such a program.

Desirable Features

The primary objective of this program was to supply the markets with potatoes of good quality and size. The size restriction for potatoes is considered a very desirable feature of last year's marketing program. However, more information is needed, both as to what sizes of potatoes consumers will buy at various prices, under various economic conditions when given a choice of purchase, and also the relative proportion of the potato crop falling within various size ranges over a period of years.¹

Also, it may be considered an advantage to the industry if the potatoes shipped to the market are of U.S. No. 1 grade or better. In recent studies of potato quality, the Maine Station² has found potatoes with grade defects in several markets far in excess of the tolerances allowed for U.S. No. 1 grade. Thus, a marketing agreement and order might help improve the quality of potatoes on the markets. However, to accomplish this requires careful grading and inspection of all potatoes. It automatically makes these two operations compulsory on the part of the handler. The compulsory phase may be considered a desirable or an undesirable feature.

Another advantage which is perhaps a complement to shipping only U.S. No. 1 quality or better is to encourage the consumption of more potatoes.

The shipment of only U.S. No. 1 quality potatoes or better with a somewhat narrower size range theoretically should encourage better handling of potatoes through the various marketing channels. Also, with a more uniform product of somewhat better quality the handling charges from the shipping areas to consumers should be slightly less, due to smaller losses and possibly to some increase in volume of sales.

¹ Merchant, Charles H. *Consumers' Acceptance of Sized Potatoes*, Me. Agr. Exp. Sta. Bul. 465, December 1948.

² Merchant, Charles H. and Woodward, Homer C. *Quality of Potatoes in Retail Stores in Boston, Mass. and Maine Markets, 1948*, Me. Agr. Exp. Sta. Bul. 466, February 1949.

Undesirable Features of the Marketing Agreement and Order

As commonly known, there is considerable range in the quality of potatoes which can be certified as U.S. No. 1. Under the marketing agreement and order it is often to the financial advantage of a grower or shipper to crowd the tolerance permitted under U.S. No. 1 standards. This is especially significant where the price differential is large between U.S. No. 1 potatoes and those of lower grades. This represents a real problem in grades and shipping-point inspection work. When shippers are crowding the tolerances allowed under U.S. No. 1 they are also encouraging lenient shipping-point inspection. Both of these are undesirable.

Closely associated with the quality problem is that of the cost involved in the grading and shipping-point inspection of potatoes. Inspection costs is an added expense to nearly all shippers, as normally inspection is not called for on all shipments. This additional cost to many central and southern Maine producers was rather burdensome where they marketed small quantities at a time in nearby markets.

For a marketing agreement and order to be successful satisfactory market outlets must be available for grades of potatoes not coming under the order. Unless the returns for the grades not permitted under the order are in line with U.S. No. 1 quality, growers and shippers are going to crowd the tolerances on all potatoes sold under the marketing agreement. In an area like central and southern Maine there are inadequate outlets for these poorer grades of potatoes. In these sections there were many more violations in proportion to the volume of potatoes handled than in the concentrated production area of Aroostook County.

Another disadvantage associated with the marketing agreement and order is that the consumer is left out of the picture entirely. Little or no attempt is made to find out what qualities are most desired. Some consumers have a preference for good quality, small size tubers. If they are unable to purchase the quality preferred they may reduce their consumption of potatoes.

Truck shipments of potatoes make the control problem much more difficult.

Under the provisions of the marketing agreement and order, certain exemptions can be made. Care must be taken that these exemptions do not become the rule, and the marketing order no longer function. This is an administrative problem requiring unusual skill for successful operation under certain conditions.

ELEMENTARY ECONOMIC THEORY OF MARKETING CONTROL

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THE major objective of this paper is to determine the degree to which available theoretical concepts are used as a basis for control policy. Most administrative committees operating under the Agricultural Marketing Agreement Act of 1937 seem to be seeking maximization of long-run returns to growers. They appear to be motivated by a complex of goals. They are not free of many of the legal or other institutional constraints inhibiting the degree to which income can be maximized or the methods which may be used by private firms. Committees know that to maximize money returns in any outlet will often lower possible maxima in other outlets or times; that heavy plantings may be induced; that the enabling statute prescribes a maximum of parity prices; and that where profit-maximization prices—which to individual firms stand as marginal revenue with respect to output—greatly exceed the marginal costs of shipping at allotted volumes, there will be universal and powerful temptation to overship allotments or to move prohibited grades, sizes, maturities or packs by individual shippers still conscious of individual competitive identities. The goals of administrative committees appear to be no different from those governing policies of non-agricultural agencies large enough to manipulate one or more profit determinants in addition to their own costs of production. To formulate shipping policy or to use theory there must be a routine in the relations among long-run profit determinants, sufficiently simple to serve as the basis for regular and systematic manipulation of one or more profit-determinants.

Net income to participating shippers could conceivably be increased through lowering costs of production or through monopsonistic pressures on prices of resources used. Joint action in production processes is not authorized. Factor costs are rarely if ever manipulated. Market control in practice means the manipulation of selling prices or of demands. For effective operation, every market control agency must achieve sufficient power over one or a few determinants of selling price to change the industry into a single firm with respect to the controlled price determinants. Except for

indirect effects upon production and procurement activities, other price determinants are unaffected.

Administrative committees are typically faced with a variety of specific questions: how much should be sold in all outlets over the season; what methods of limitation should be used; how should shipping rights be allotted; how should sales be allocated over alternative outlets; what are the optimum proportions by grade, size, maturity or pack; what time distribution will contribute most to the long-run profit goal? There is another set of questions relevant to groups other than growers: how do various regulations affect the volume of business and operating margins for handlers in current and subsequent seasons; what happens to demand levels in other outlets or subsequent periods; what happens to volume of production of the regulated good in the regulated area or in competing areas; how is the output of competing goods affected; what happens to volume of consumption and the proportion of income required to command such consumption in total and by special classes if price discrimination is used? One test of the usefulness of theory is the degree to which methods for answering such questions are suggested.

Methods of Income Enhancement

Federal orders seek to increase incomes through manipulating total receipts and not by decreasing costs. They provide for adjustments to given demands and for manipulating demands through central control over timing, constituency or allocation of sales. Product variation, intended to decrease substitution elasticities and thus to protect against lowered prices of competing goods, can be achieved only through grade-size controls. No direct advertising or other measures intended to lift demand levels may be used. The economic theory of federal marketing control is thus much simpler than that of state programs which may authorize joint control over the production function, factor-costs and both product variation and demand manipulation in addition to the techniques used in federal agreements and orders.

To achieve price or demand control, shipping authority over all or a large part of industry output must be centralized in a single agency. This can be done by cooperative marketing, amalgamation, product differentiation by large handlers or by agreements and orders. Prices can be manipulated in many ways. Product differentiation may decrease substitution elasticities and the size of market.

Advertising may lift demand. Increased buying power will raise some demands. Weather clearly affects some prices. Volume, time and space distribution and freedom of wholesale receivers from fear of unexpected gluts will affect season average price. Allocations over alternative outlets will partly determine season average price and thereby season income for multiple-purpose products. Grade-size proportions affect level of demand as well as price. The net relations of these factors to price are often fairly well known.

Prices varying with unknown factors, unsystematically, without stability or with such uncontrollable variables as weather, buying power, output of competing goods and perhaps over-all quality cannot be manipulated by joint action of growers or handlers. But within broad limits, other factors can be so controlled and net income thereby enhanced. To use most of these devices, two conditions are necessary: all handlers must participate; violations must be prevented. The techniques for such control may be classified into three groups: limitation, where the supply sold in any outlet or time is less than that which would move where shippers operated atomistically; diversion, where proportions sold in alternative outlets are different from those which would result from atomistic sale; and demand manipulation, where levels of demand are raised or maintained by control over timing, grade-size composition, spatial distribution or pack. So long as there are depressions, irregular outputs per acre of the regulated or competing goods and irregularity in other determinants of seasonal demands, there will be seasons in which demand elasticity for produced supplies is very low at the field level for industries which are well adjusted to long-run demand prospects. Under these circumstances, only marketings and not production can be controlled. For effective marketing control, all firms must take part and the temptation to violate allotments must be restrained.¹

In a competitive industry, shipments will be continued until

¹ Limitation programs are not always confined to emergency years when demands fall or yields rise. Capital—or acreage—may have become too large in face of the long-run demand outlook. At best, limitation eases liquidation through bankruptcy and revaluation of assets or through tree or vine pulling. At worst, it prevents effectuation of these adjustments which alone touch the fundamental problem. It is always difficult to know when capital is redundant—as in 1929-1939 for many industries now prosperous and presently for industries which have lost regular export outlets. Should trees and vines be pulled, requiring years of gestation if demand again rises; or should such industries limit sales and maintain productive capacity in the hope that political differences and war wounds will be healed?

the expected average price at terminal falls to equality with realized average costs of harvesting, packing, shipping and marketing—or when field price falls to zero and there is no contribution to production or capital costs whatever. If—when demand falls or yields rise or even when an industry is just too large for its demand—sale of full production would reduce field returns to zero, there can be no successful or enduring limitation of marketing without full industry participation. With such full participation and with effective enforcement, field price may be raised by many methods towards but not to the monopoly equilibrium. Such control will always be unstable because price—which is effectively marginal revenue with respect to output for a concern still competitive in all of its production and procurement and in most of its selling activities—will always exceed the marginal cost of marketing at the quantity allotted to the individual. Thus the decisions of a control agency must have the full effect of law.

In the short run at least, limitation will always involve hostility of interest between growers and groups of handlers, processors or consumers.

Where only part of an industry participates in a program, limitation will always lift group returns but by less than were all handlers to participate. There will be two inducements to violate allotted shipping rights: realized price will exceed marginal shipping costs at allotted volumes for all individuals; outsiders will obtain a higher price as a result of limitation by participants and will also move a larger volume than they would without limitation.

The effects of limitation cannot be measured unequivocally and for many of them, economic theory does not indicate either the data which must be obtained or the calculations which must be made in order to obtain answers. Limitation effectively translates a competitive industry into a monopolistic firm with respect to a very few price determinants but leaves most selling and all production and procurement activities unaffected. Marketing cooperation also means that with respect to some cost and price determinants, all or part of an industry becomes a single firm. However, the industry formulates its own program and it is not effective unless large majorities favor effectuation. No limitation program can long endure if there is an unregulated minority willing to capitalize upon restraints by other shippers while remaining free of any obligation to limit sales. No complete monopoly is ever created by these

programs even in the few profit determinants which are controlled. There is no indication in the many years of operation of these programs that the competitive alacrity, self-respect or entrepreneurial independence of growers and handlers is diminished. In view of the proper applicability of limitation programs to emergency situations in well-adjusted industries and the checks inherent in their prolonged use, it is doubtful that resource distribution is much distorted from the competitive norms. If limitation programs are effectively used in the two problems for which they are designed, they will in fact tend to prevent the deviation from competitive norms which result from the physical attributes of production, the small scale of output and the organization of marketing in fruits and vegetables.

Limitation raises aggregate net income by raising sales price in ranges of inelastic demand and by saving cost outlays in marketing the quantities which would be moved in the absence of control. Such limitation is not immediately desirable from the standpoint of any other group. However, the scale of operation, the rigidity of marketing costs, the physical characteristics of production and the inability quickly to adjust output, the sudden and uncontrollable deviations both in demand and in output and the organization of markets differentiate the produce industries from other parts of the economy. Limitation will always reduce the amount of goods consumed and thereby will damage consumer interests, although total consumer expenditures may also fall and some income classes may be clearly benefited if limitation is associated with price discrimination. The maximum possible transfer of income from processors, handlers or consumers to growers, is as discussed above, not often attempted. These groups may be benefited over the long run if controls maintain productive acreage which is economically profitable in face of long run demands but which would be destroyed because growers acting alone could adjust neither marketing nor production as demand changed or as yields per acre varied in a series of several seasons. With uncertainty of future demand, short-run transfers of income which facilitate maintenance of capital plant may not be hostile to long-run public interest. While the bankruptcy process would benefit other groups in the short-run, such gains in the form of more and cheaper foods and raw products might be more than countered by the relief costs associated with general business failure. The major danger lies in the abuse of

limitation to prevent desirable contraction in industries which are too large. Further, exaction of maximum possible profit in any season may damage growers through depression of demand levels in subsequent seasons and by inducing increased plantings of the limited product and its competitors.

The major issue here is the alternative to limitation. If, without intervention, field price fell to zero and crops still lay unharvested, the costs of bankruptcy and relief would necessarily be incurred. Production control aimed at profit maximization would involve more stringent output control and higher prices with even greater transfers to growers than would limitation. Depending upon the support percentage and the level of parity, support prices could involve even more limitation and would unquestionably lead to production controls if prolonged. Compensatory payments with markets cleared would cost more to government than would price support whether with destruction, gift, diversion or storage. Such payments with storage may involve least cost to government and consumers if demand recovers fairly rapidly. Perishable crops with low demand elasticities cannot be stored effectively. Marketing agreements and orders will ordinarily mean less restriction of output and less cost to government than will production control or price-supports and compensatory payments when demand elasticity and demand levels are unusually low and support is calculated from a parity price based on years when demand was relatively high.

Diversion Programs

Where outlets are separable and leakage can be prevented, discriminatory pricing will yield higher returns to the group than would uniform monopoly pricing. Limitation in major outlets frequently requires control over other channels. Violations will be induced both by the fact that realized prices exceed marginal shipping costs and because price differentials induce handlers to buy low and sell high where such differentials exceed the cost of transfer between discriminated markets. Without central control, atomistic shipping patterns will lead to equalization of field prices in all outlets. No generalizations may be made with respect to effects upon consumers since different classes are involved.

In limitation and diversion programs for staple crops and in markets substantially meeting the independence assumption, static theory lays out clearly the data which must be obtained and the

principles which must be applied in order to benefit growers. It also specifies major dangers to growers and indicates the divergences of interest which may be expected. But neither here nor elsewhere are there theoretical techniques which effectively indicate the impact of such programs in welfare terms.

Interrelated Demands

Intra-seasonal programs are mainly intended to prevent glutting in one or a few outlets and its spread to other outlets. There are three main types of such controls: rate of flow where time periods are interrelated; grade and size limitation; and minimum standards of quality, maturity or pack.

Markets may be glutted because small-scale handlers who are distant from markets react simultaneously and alike in accelerating shipments in response to market opportunities, high holding costs or prospects of heavy shipments later in the season. But if all react similarly, expected prices may not be realized and actual field price may be reduced below zero. No order can eliminate the risk of demand changes over the transit period. Marketing orders eliminate the risk facing wholesale receivers that unforeseen acceleration of arrivals may occur. Price-falls at wholesale do not seem to accelerate retail purchasing until retail stocks are cleared. The effects of the glut may therefore cumulate over time. Few facts on such interrelations are available but the interest of the wholesaler in margin rather than price makes such occurrences consistent with efforts of producers and wholesalers each to protect against unforeseen changes in price or condition of products. Except to indicate that total sales may be increased and total receipts to growers may be enhanced without loss to receivers for whom a major risk is eliminated and with no loss to consumers who may obtain a more desirable pattern of purchases, theory does not indicate maximization adjustments or their effects in temporally interrelated markets. Actually, rate of flow control may be intended to reduce wholesale market risks and by reducing marketing costs, raise grower returns. Thus far, no facts are available to form hypotheses.

Grade and size limitations have two declared purposes. First, heavy sales of some grades or sizes may bring losses. Second, there is evidence that flooding of one or more grades and sizes may reduce the level of demand in substitute classes if differentials become unusually large. Again no theory sets out optimum distribution prescriptions where demands for various grades and sizes are re-

lated. It appears that no damage is done to other groups when growers maintain the value of aggregate output by controlling the grade-size constituency of the sales in related markets.

Minimum standards of grade, size, pack or maturity have much the same objective. In response to individual opportunity or compulsion, handlers may increase their own returns by selling low quality or poorly packed products. They may thereby lower the demand for all classes of the commodity. Again there are little data on the effects of sales of low grade, small size or poorly packed products upon demand for other packs or grades and sizes.

Summary

Administrative agencies in marketing agreements and order programs apparently seek a price and profit goal consistent with long-run stability of income. Relatively few techniques of control are authorized. Production and procurement efficiencies are not sought through federal market control. Only the amount, the grade or size, the time or place distribution and the minimum standards of shipments may be controlled. Useful theory should set out the conditions for maximization and provide means to assess the impact of various programs upon growers, handlers, processors and consumers. Federal programs are intended in the main to make possible a monopoly-like adjustment to demands or to manipulate demands by control of sales in related outlets. Individual firms therefore lose little of their competitive identity and may increase their incomes by differential skills or scale in producing, procuring supplies or factors, in differentiating their products, in sales promotion and in nearly all merchandising activities. Only one or a few price determinants are centrally manipulated. Programs involving limitation may be analyzed effectively in terms of available theory. Diversion programs involving price discrimination may also be handled effectively. Programs involving rate of flow control, grade-size or other related factors and minimum standards cannot be analyzed in terms of existing static theory. No useful theory of related demands is yet available. The facts of market organization and operation on which such theory could be based are not determined. Few control boards—or anybody else—could unequivocally predict the effects of manipulating any short-run price determinant in one market, in several independent markets and especially in interdependent markets.

THE DEVELOPMENT OF BASIC DATA UNDER THE RESEARCH AND MARKETING ACT

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AMONG all progressive and intelligent peoples of the earth, the quest for more and better information of all kinds goes forward year after year. This is as it should be, for "genus homo" still has a long road to travel to attain the perfection of complete knowledge and understanding of mankind, to reap the fruits and complete fulfillment of man's productive activities, and to find the answer or "reason why" for all things material or spiritual. From the earliest records of man on earth, there are several indications of the use and importance of basic data. The Mandarins of old China and the Pharaohs of Egypt recorded production of food, fibre, and livestock, and used these basic data in formulating plans for future agricultural development.

Among primitive people, however, the fight for survival was usually so important that hoarding of some food was about the only exercise given the grey matter of these pugnacious ancestors. During the colonization of our country very few records of crop acreage or production are found before the Revolution, and little desire on the part of farmers for state and national crop reports during the first third of the 18th century. Letters and reports from our earliest Presidents, principally Washington and Jefferson, indicated their belief in and use of basic data and other information concerning farming operations at Mount Vernon and Monticello. In 1839, Congress made the initial appropriation of \$1000 for distribution of seeds to farmers and for collection of agricultural statistics.

During the 110 years that followed, work on basic data and related information for farm products, although it has expanded remarkably, has not developed in proportion to the increases in population, wealth, and complexities of our national agriculture. There is still a material lack of the basic production and marketing data needed for many phases of the agricultural program, both on a state and national basis. The United States Department of Agriculture, through its Bureau of Agricultural Economics, has scientists and technicians who are fully capable of expanding coverage and leading the work of collecting basic data, but facilities have

been lacking for anything like the complete job these newer marketing studies and developments demand. Since World War II many marketing problems have been centered in specific regions, states, or counties. Demands for fundamental facts increase rapidly as unstable economic conditions threaten any local agricultural industry.

These facts were recognized by Congress in a general way when preparing and passing the Research and Marketing Act of 1946. Section 203 of Title II of this act states in part, "The Secretary of Agriculture is directed and authorized to collect, tabulate, and disseminate statistics on marketing agricultural products, including, but not restricted to statistics on market supplies, storage stocks, quantity, quality, and condition of such products in various positions in the marketing channel, utilization of such products, and shipments and unloads thereof." Section 204 states, "The Secretary of Agriculture is authorized to make available from such funds such sums as he may deem appropriate for allotment to State Departments of Agriculture, State bureaus and departments of markets, State agricultural experiment stations, and other appropriate State agencies for cooperative projects in marketing service and marketing research to effectuate the purposes of Title II of this Act."

The Act apparently provides both a mandate and an opportunity to agriculture to get its research and marketing machinery in better order. Initial response to provisions of the Act has necessarily been slow, as its enabling features have required testing and experience. Also, it has taken about three years for many state, federal, and independent agencies to fully understand RMA provisions and to set up matching funds so projects could be submitted for approval. In his discussion of a paper titled "State Frontiers in Agricultural Statistics" presented by Arnold P. Benson at the September 13, 1948, meeting of the American Farm Economics Association, R. K. Smith indicated that nine states had cooperative RMA projects in operation that were developing primary statistics and related basic data for fruits, vegetables, hogs, poultry, milk, grain storage, alfalfa dehydrating plants, and prices received by farmers. Mainly, emphasis on all of these has been placed on the development of data for areas smaller than the state, complete enumerations or sample surveys of acreage and tree numbers, monthly prices, and monthly marketings.

Today, cooperative RMA projects of this type have been widely

extended. Allotment of matching RMA Title II funds, for developing new basic information to improve marketing services, facilities, and outlets, are negotiated through the Production and Marketing Administration. The approved programs are carried out under cooperative agreement between that Administration and the State Departments of Agriculture, the State Bureau of Markets, or other appropriate state agency. Simplified procedures for PMA-RMA programs in states have encouraged many State Departments of Agriculture to begin work in developing much needed programs relating to marketing facilities, services, outlets, and information. A brief summary of the essential criteria or requirements in setting up an RMA basic data project may be of interest. These include:

- (1) An objective which promotes the welfare of agriculture within the purposes of the Act.
- (2) Cooperation of all agricultural agencies.
- (3) Formal cooperative agreements.
- (4) Appropriation of state matching funds.
- (5) Coordination of the project programs to avoid duplication of work at a district, state, regional, or national level.

As an example of an objective, consider the plight of filbert growers in Oregon and Washington. Because of large filbert stocks on hand, average prices received for filberts by growers of the two states dropped from \$551 per ton in 1945 to less than half that price in 1948. Producers appealed to Federal and State departments of Agriculture, and to their agricultural colleges for help in saving their industry. Interested agencies, including the Filbert Co-operative, met and outlined a first objective which was, briefly, to expand market information for filberts. The stumbling block to a reliable market information program proved to be the lack of important basic data of tree numbers by varieties and age groups. The most recent filbert variety survey was made by WPA in 1935 and 1936. No basic data exists that would indicate probable trend of production in the immediate years to come, or show to what extent tree removals have influenced bearing surface of filberts. As in most cases of a similar nature, basic data is the key that unlocks the door to a sound information program. Incidentally, a PMA-RMA sponsored project for filberts is now assured for both Oregon and Washington beginning in the next month or two. It will supply acreage, tree numbers by varieties and age groups, and production check data.

Cooperation of all agricultural agencies is essential in planning

any RMA project, whether it relates to market expansion, basic data, or technical assistance. Every Federal and state agency that is connected in any way with a proposed project program should be given an opportunity to cooperate fully by taking either an active or advisory part in the program.

Formal cooperative agreements are also an essential of each RMA project. There are the formal agreements between the Production and Marketing Administration and the state agencies concerned, and also the agreements and working arrangements among the interested agencies within the States. Fortunately a majority of the BAE field offices have long had joint Federal-State programs in operation under formal cooperative agreements, chiefly with State Departments of Agriculture, but in some cases with the State Agricultural College. Since RMA has made such a strong point of this type of cooperative work, there is inducement for other State Departments of Agriculture to sign formal cooperative agreements with BAE and other agencies carrying on RMA project programs. In those states in which formal BAE agreements have existed for several years there has been relatively little difficulty in securing sponsorship of much needed marketing research projects.

As previously indicated, one of the main reasons why RMA projects were slow in starting during 1947 and 1948 was that state agencies had made no provision for state funds for matching. Officials in charge of the administration of RMA look with considerable favor on marketing research or service projects for which state agencies are willing to bear half the expense. An appropriation by the state legislature is the best assurance to the Research and Marketing Administration that state agricultural agencies mean business. In some cases the State's contribution may be partly through technical assistance employed with state funds.

Perhaps the chief factor to be considered in developing an RMA project is that of coordination of agencies and integration of the program. Functions of the Departments of Agriculture, Experiment Stations and Extension Services should be clearly outlined to avoid duplication of work at county, district, state, regional, or national levels. The principal agricultural agencies in a State must work closely together if the marketing program of each is to be successful.

A few basic data projects are now in operation in the Pacific

Northwest Region, as well as state projects in Oregon and Washington, and several new proposals have been submitted. One of the earliest projects to be developed related to the soft wheat industry. For at least two decades, marketing of soft wheat produced in Oregon and Washington and northern Idaho has been a "problem child" of the entire wheat industry. Wheat producers there generally prefer to grow soft wheat to the hard varieties as the yield per acre is much higher. During the years when this country was at war, especially during World War II, production of soft wheat was considered as important as any other kind as it helped in the all-out drive to produce more food for domestic use and for our allies. At the close of the war, high production was still encouraged by government support prices, as it was necessary under the Marshall Plan to ship millions of bushels to starving people in foreign countries. About two years ago, however, it became obvious to leaders in the wheat industry and to many wheat growers that as soon as requirements under the Marshall Plan declined, the Pacific Northwest would be faced with a wheat marketing problem more difficult than ever before.

Credit should be given to E. J. Bell, Manager, and the Board of Directors of the Oregon Wheat Commission, for initiating a program directed toward solving the soft wheat marketing problem. Early in 1947 Mr. Bell and his organization began development of a Pacific Northwest wheat project. They realized the opportunities for assistance under the Research and Marketing Act and were desirous of matching funds to secure every possible help in solving wheat marketing problems for the Pacific Northwest states. It was apparent from the start that any project work performed in Oregon would be of no value unless similar work was carried on in Washington and northern Idaho, and there has never been any thought but that the project must embrace all three states.

At the earliest meetings with the Washington-Idaho Wheat League, large producer groups and the Washington, Oregon, and Idaho State Departments of Agriculture and colleges of agriculture, Mr. Bell's plans were generally approved. From the outset the co-operating agencies found a dearth of information needed for expansion of marketing services or developing new markets. Records were very incomplete regarding utilization and disposition of the Pacific Northwest wheat crop after it had left the grower's hands. In other words, basic data were required, historically for as many

years as could be recorded for coastwise boat shipments, rail shipments, and foreign exports—all these by destination; also, quantities of wheat used locally for milling into flour and feed, wheat utilized by feed mills, quantities of wheat sold or traded by farmers to farmers, and an accurate check of acreage and production of wheat by varieties. None of the basic data for these items were available at the time the project began. At the close of the fiscal year just past, results of work on the project indicate that the historical record on coastwise shipments and foreign exports of wheat has been almost completed. Records had been obtained from most of the larger wheat mills, and an enumerative survey of smaller feed mills was nearing completion. The project has been extended and broadened for the current fiscal year.

Wheat variety surveys are now under way. Plans are being made to check railroad waybills in Milwaukee, St. Paul, Omaha, and local points within the state to obtain historic data of rail shipments of wheat by destination.

From the original start made by Mr. Bell and his Associate Project Leaders, N. I. Nielsen, Agricultural Statistician of Oregon, and Professor Harrington of Washington State College, the program has expanded this year to cover work not only on basic data but also other marketing information and development of new market outlets. This was brought about by Sverre N. Omdahl, Director, Washington State Department of Agriculture, who made specific requests to the State Legislature and was provided with funds for matching purposes to aid in research and marketing problems of all Washington farm products, with special emphasis on wheat. After calling a meeting of leading wheat producers and interested agencies, Director Omdahl submitted project proposals to assist in carrying forward the original basic data project and also to provide a new project aimed at developing both domestic and foreign markets for wheat. The new project will be closely coordinated with all other programs relating to Pacific Northwest wheat.

Estimated total cost of the project for the first two years is \$35,000. To maintain the new basic data series currently will cost at least \$10,000 per year, and state agencies expect to carry on their full part of the program. The question uppermost in the minds of practical wheat men is whether this outlay of funds can be justified. Evidence is overwhelming that returns from the investment will be far above the cost. For example, basic data already indi-

cates lowered sales of wheat and flour in the southwestern states, and if soft wheat sales there can be stimulated to regain lost ground, sales of wheat and wheat products will gain about three million dollars. Paralleling the basic data survey of wheat is one on transportation and rail rates by other than government agencies. Should the request for a downward revision of freight rates result in only a general reduction of one cent per bushel for wheat, the savings to producers would equal one million dollars.

It would appear, therefore, that the Pacific Northwest basic data wheat project is both paying its way and paving the way to improvement and expansion of the marketing program.

A fruit project started a year ago in Washington under cooperative agreements of the State Department of Agriculture and BAE's Seattle office with PMA-RMA, has developed a series of apple prices by varieties and sizes for 1947 and 1948 crops using reported F. O. B. sales of nearly 30 million boxes of apples. Significance of this data is that it shows the varieties and sizes of apples that sell at premium prices, and those that fail to bring cost of production. Another phase of the project was a combination mail and enumerative survey of fruit trees and grapevines by varieties and age groups. Use of state horticultural inspectors to secure records from orchardists who failed to respond by mail, has not proved entirely feasible, but results for some counties have been excellent. A preliminary tabulation of growers' record cards indicates a large increase in acreage and tree numbers for many kinds of soft fruit, and indications of fruit tonnage increases in the next five years range up to 25 percent (for sweet cherries). Expansion of grape acreage provides the indication of potential production by 1954 of double the present production. Basic data on prices of apples and numbers of fruit trees and grapevines secured by this PMA-RMA project is an example of the type that brings immediate returns to farmers and fruit growers and their allied organizations. Similar projects are being successfully conducted in other States.

From a personal viewpoint, the extra administrative and technical work of carrying on RMA basic data projects in the state of Washington has been much heavier than first anticipated. This indicates the need for additional capable technicians in BAE field office staffs to carry on such work. Accordingly, my advice to agricultural statisticians about to embark on cooperative RMA basic data projects is to be certain of sufficient funds for another top

professional on the staff, in addition to the clerical workers usually supplied.

In conclusion, basic data and related agricultural statistics are now being developed through cooperative RMA projects that would not otherwise exist. Of all activities under the Research and Marketing Act which may be undertaken to further research or to improve the marketing of agricultural products, basic data projects will continue to develop the type of definite results that will be widely useful to all interests in guiding current and future production and marketing programs.

DISCUSSION

GEORGE A. SCOTT

California State Statistician

The Research and Marketing Act greatly broadens the opportunity for Federal and State agricultural agencies to assemble additional data about farm products, when these data are helpful to producers in working out more efficient marketing methods. With its country-wide network of field offices, the majority of which are jointly operated with state agencies, the Bureau of Agricultural Economics is in logical position to participate in this expansion of basic information, when the need for data dictates that such action is worth while and appropriate. Requests for new and detailed agricultural data pile up in the offices of the State Agricultural Statisticians testifying to the need for more and better information in this field. These requests originate mainly among state and federal agricultural workers, and in producer groups seeking solutions of their marketing problems.

My comments relate specifically to the topic as it applies to these state offices of Agricultural Estimates, Bureau of Agricultural Economics, where RMA project work may be carried on with cooperating state agencies. They are based largely on our two years' experience with RMA project work in the California office.

The California office began planning RMA projects in the winter of 1946-47, and proposed specific projects early in 1947. The State Legislature authorized and appropriated funds for RMA project work in the spring of 1947 for use during the 1947-48 fiscal year. About a year later we were allotted limited federal RMA funds and given the green light for RMA project work, under standard agreement with the Production and Marketing Administration. Thus, before July 1, 1948, only a small beginning was made on one project. State funds again were made available for the 1948-49 fiscal year, and by early July we had assurance of matching federal RMA funds. Two main projects were in operation throughout most of the last fiscal year. In addition, we completed a small special survey, and started another good-sized project. The total combined funds used by

Agricultural Estimates for RMA project work in the state during the last fiscal year amounted to \$88,000. On one of these projects the counties contributed additional direct assistance, amounting to approximately \$25,000.

One project supplemented and enlarged upon the annual fruit and nut acreage surveys carried on in the state, in which the acreage of these crops are recorded farm by farm, and are summarized by county, by age groups, by kinds, and by major varieties, and include records of pull-outs and new plantings. The second project was concerned with developing poultry statistics through sample interview surveys. The third was a survey of bush berries in the state. The fourth involves surveys of the progress of raisin harvest, and estimates of raisin production, for which most of the work will be done in August, September, and October of this year. All of these were begun with the intention of maintaining the series of data year by year, so far as they proved to be useful to producers in connection with their marketing programs.

These projects have produced useful statistical data. However, some of our experiences with them have not been altogether happy, resulting in some sobering reflections.

Most of our difficulties stemmed from the fact that the responsibility for practically all planning, administration, operations, tabulations, analysis and preparation of reports, fell upon regular staff members who already have overburdening demands upon their time. Thus, the RMA project work seriously interfered with the regular duties required of our staff. Moreover, under such conditions, full justice could not be done the new projects. You may well wonder why additional help was not employed. The answer is that it is not possible to find qualified people on short notice to step in and carry off these jobs; nor is it possible to attract or to employ capable men in positions that offer little assurance of tenure. We also grossly underestimated the amount of time required of professional staff members to carry out these RMA projects.

Many difficulties and delays were encountered in setting up details of operation for proposed expenditures, clearing schedules, hiring personnel under rigid state and federal Civil Service regulations, and related matters. In order to start an RMA project in our state, a proposed budget must be drawn up many months in advance, hoping that the State Legislature will approve, that the project will be approved in Washington, and that adequate matching funds will be made available. Thus, financial plans, and at least general work outlines, must frequently be developed a year or more ahead of actual operations. Detailed plans for the conduct of a project must be worked out well in advance, and must be frequently revised to conform with funds finally allocated for the work. Many of these irritating and time-consuming details could be taken in stride if the statisticians and their assistants had adequate time to devote to them.

We have also been requested to make special studies or surveys on short notice, after it is too late for such projects to be included in our scheduled program. Normally, little can be done about such requests because of expected time lapses in clearance and approval. However, we were fortunately able to respond to two of them, because general provision had been

made for such situations, and one of our projects could be expanded or contracted to meet such emergencies.

It seems proper to say here that many types of agricultural data have maximum value only when they appear in a continuing series. Thus, it seems that proposed development of basic statistics under RMA projects deserves careful advance planning, and reasonable assurance that useful series will be continued. The uncertainty of simultaneously obtaining both state and federal matching funds for such continuing work is a source of considerable worry.

I suggest that State Statisticians exercise due caution, before new RMA projects are undertaken, to plan the work carefully in all its stages well in advance, to see that provision of both state and federal funds will be fully adequate to do the job outlined, and to assure the employment and training of capable professional personnel to carry on the work. When state appropriations for such work are based upon forward budget requests, one can hardly expect to go through all the preparatory steps for a good-sized project in less than a year, and it may well take two years before everything is synchronized.

Perhaps BAE could make more effective contribution to the development of basic statistical data for use in RMA programs, if more direct allotments were made to BAE by RMA. Such an arrangement would make for greater flexibility in operations, and would result in increased efficiency and uniformity in performance and results, especially when several states are involved. Proposed RMA projects relating to the marketing problems peculiar to a single state or to only a few states may best be carried on with matching federal and state funds. But it is believed that the procedures for implementing these cooperative projects might be simplified without impairment of the controls that are necessary in accounting for the use of public funds.

THE MAILED INQUIRY AND METHODS OF INCREASING RETURNS

FLOYD K. REED

Colorado State Statistician

THE mailed inquiry has provided the major source of information on the nation's crops and livestock since Abraham Lincoln's Secretary of Agriculture first sent out inquiries during the Civil War days of 1863. Significantly, it was learned at that time that the country's food supply would be adequate to meet war needs. This method of obtaining up-to-date information regarding agricultural production, combined with inquisitive and observing field travel and contacts with individual farmers for certain types of information, has been the backbone of the country's crop and livestock forecasting and estimating program for more than three-fourths of a century. With this long record of achievement, it would seem that much can be said in its favor and little need be said in its defense. More recently through a succession of years in World War II and down to the present, as late as August 10, 1949, use of the mailed inquiry has proved its worth as a reliable source of information regarding production of the country's crops and livestock. The crop and livestock reports compiled from this type of information during World War II formed the basis for establishing a reliable food production and distribution program. As in 1863, but this time through six war years and subsequently, large crops were revealed by this source of information. Plans for effective use of our food supplies were and are predicated upon the reliability of data thus obtained. It seems now quite clear that when we were exporting large quantities of food to all parts of the world during these war years we could easily have exported ourselves into a condition of serious food shortage or even semi-starvation had these reports not been reliable.

Much is taken for granted when we use the mailed inquiry as a source of information. In the first place, the mailed inquiry makes use of the facilities of the Post Office Department, a far-flung and wholly reliable government agency, in lieu of setting up an expensive field organization for making the necessary contacts. It assumes a high degree of intelligence, education, and ability on the part of recipients. It is one of the best illustrations of the operation of our democratic process wherein producers of crops and livestock

cooperate with a government agency in their own and the public interest.

Other advantages of the mailed inquiry are its comparatively small cost, and the speed with which the information can be cleared, even in a country as large as the United States, through use of its extensive and swift transportation system. The mailed inquiry makes farmers or ranchers feel that they have a personal part in making the report for their own industries. One who cooperates in filling out a mailed inquiry and thoughtfully makes a record of his judgment and knowledge probably comes very near giving his real views regarding the condition of crops or agricultural developments in his locality. One who votes his convictions in the privacy of the voting booth might vote differently if someone were looking over his shoulder. A substitute for this type of mass judgment or "safety in numbers" factor in appraising the condition of crops or livestock would be extremely difficult if not impossible to devise. The use of this mass judgment factor has proved its worth many times. It is the foundation of the crop-forecasting system. The good judgment of many minds tends to give stability to the appraisal. Most judgment information has related to the condition of crops and livestock, but it has also been used to a limited extent in measuring the changes in crop acreage and in livestock numbers. In addition to judgment information, "sample" data concerning individual farm operations, such as crop acreages and livestock numbers, are obtained through use of the mailed inquiry. These form an essential part of the fact-finding program.

If we were to sum up the advantages of using the mailed inquiry, we might list *speed*, *economy*, and *reliability* as the three great virtues of this method of obtaining information regarding the country's great and diversified agricultural plant.

Problems and Difficulties in Securing Response

Even with the three great virtues of the mailed inquiry, the very title of this paper implies that difficulties are being experienced in obtaining adequate replies. This title might even imply that use of the mailed inquiry was on trial or was facing competition. Both inferences are at least partially correct.

A comparatively recent inquiry to BAE field offices brought many remarks about the difficulty of obtaining replies to mailed inquiries, but there was little comment about the cause of poor response. If we are to understand why we have problems of obtain-

ing a sufficient number of returns or a sufficient percentage of returns we must first understand why we are experiencing these difficulties. Let's think about these for a moment.

Subsequent to passage of the Homestead Act of 1862, particularly in the West, the United States Government was viewed by many as big-hearted, a government which gave every man 160 acres of land for the mere act of residing upon it and "proving up." The Government itself was a rather abstract or incidental sort of thing in the minds of many people. Many people weren't conscious of the Government touching their daily lives to any considerable extent other than through the Land Office. There may have been a strong feeling in those days that only good came from government, partisan political feelings may have been less intense, and views on social philosophy were perhaps less controversial. Income taxes were for the most part nonexistent. In those earlier years and well into the present century, when farmers and ranchers received crop or livestock inquiries from a government agency, they viewed it pretty much as an honor or a privilege to furnish information to a generous government. Because the economy of the country was less involved than it now is, these inquiries were shorter and came less frequently. With economic problems becoming more involved and the agricultural industry more highly developed, these inquiries have grown longer and the farmer receives them more frequently. Recently, in many cases, instead of feeling that he has been singled out as a person worthy to do his government a small service, he is inclined to look upon these inquiries as "just another of those things."

Only 15 years ago crop and livestock inquiries comprised the principal kind of franked or government mail received by most farmers and ranchers. In recent years they receive government mail from many sources and many of them give hours of their time to serving on government agency committees of various sorts. (Many also serve on county and state boards and committees not directly related to Federal government activity.) This leaves less time for filling out crop and livestock inquiries and many feel that in doing this type of committee work they are doing all the "useful citizen" work for which they have time. All these developments have increased the difficulties of obtaining adequate response to mailed inquiries, but their growth was *gradual* the first half of that 15-year period.

During World War II these aversions *increased rapidly*. Among

the causes were irritations resulting from price regulations and shortage of labor and material. During that comparatively short period income taxes came as a new experience to most farm and ranch people. Changes in farm ownership resulted in many old-timers who had been crop reporters for many years leaving the farm. In a goodly portion of cases they did not pass the crop-reporting responsibility to younger hands. Occasionally one meets an old-timer at agricultural meetings who points out that before retirement from the farm he was a crop reporter. One meets others who say, "I used to be a crop reporter but quit because of the pressure of other activities." Still others adhere to the old bugaboo, "I used to be a crop reporter but gave it up because I felt that it was only for use of speculators."

These general considerations, together with the *negative influence of much adverse criticism leveled at government* in recent years, have greatly reduced returns. This, together with the very presence and demanding activities of many public agencies, has done much to dry up the source of information so fruitfully available through use of the mailed inquiry. The agricultural statistics agency needs the help of all these agencies in informing farmers and ranchers of the need for these basic facts and in overcoming the negative attitude toward furnishing them.

If we are to increase both the actual number of returns to mailed inquiries as well as the percentage response, we must take steps to overcome these inherent difficulties.

In light of the above obstacles, it appears that the kind and form of the questionnaire may be secondary to the inherent willingness of the farmer or rancher to respond. The questionnaire itself involves the mechanics of the problem, but the willingness to respond can only be increased by a broad-scale and continuous educational process. It is in this field that other agencies working with agricultural groups can be most helpful.

Methods of Increasing Returns

Methods of increasing returns may be divided into three categories: (1) Appeal letters or letters of explanation; (2) the questionnaire itself together with the mechanics of distribution; and (3) education as to the need for making the report. The educational aspects need immediate as well as long-term and persistent atten-

tion. This paper does not deal with the mechanics of selecting the correspondents or the methods of insuring proper distribution of returns.

Appeal letters should be impersonal in an individual sense and free from reference to controversial subjects. Many people are public spirited, and an appeal to this aspect of citizenship or that the information is being obtained in the interests of the industry generally or the particular commodities which the individual produces may be effective. Emphasis on the fact that response is voluntary and that individual reports will be held in confidence has strong appeal. (The feeling on the part of many, however, that there is a relationship between reports and income-tax collections is difficult to overcome.) Pointing out that serving as a crop or livestock correspondent will increase the individual's power of observation and retention of information seems also to be effective. A little encouragement in the way of suggesting that the correspondent should not make too hard work of filling out the report is helpful, and statements like "report for your own farm and in addition just put down what you know about conditions from your day-to-day observation in your locality" are also helpful. If the recipient can be made to feel that it is in his interest to fill out the questionnaire, he will be more likely to respond. As one of our reporters put it, "A man ought to fill out those questionnaires for his own selfish interest if for no other reason." The old statement that "a man's judgment is no better than his information," followed by a reference to the effect that "working without agricultural facts is like working in the dark," appeals to the practical minds of rural people. It is almost a duty to point out that having accurate facts regarding agricultural supplies is as important in making a profit in agriculture in these times as is use of new varieties, adequate fertilizer, and control of insects and diseases. Pointing out this important fact is an essential part of the immediate, as well as the long-term, educational program. Mr. Creer of our Montana office has developed a short appeal letter which starts out, "Has someone been kidding you?" He then goes on briefly to shoot down the clay pigeons regarding the impression that facts concerning agricultural production are for the benefit of the speculator only. Some years ago the Colorado office developed an appeal letter which started out, "There's no use kidding," and then took the farmers and

ranchers into our confidence regarding the fact that returns were becoming inadequate for proper service to the industry. This met with fine response and did much to increase returns.

It isn't practicable in a paper of this sort to deal with all the ways of appealing to rural people for cooperating in returning mailed inquiries. Yet a few additional points should probably be mentioned. No effort should ever be made to make replies compulsory. My experience in studying the Japanese crop-reporting system revealed that, even in a country like Japan where requests were mostly orders, the agricultural statistics data had a pronounced downward bias resulting partly from this compulsion factor. The situation there, as in some of the war-torn European countries, was no doubt aggravated by the exacting food-collection system, but the principle of what happens under compulsion is well illustrated. Because of the rather serious nature of the business, anything of the "atta boy" or "let's die for dear old whozis" nature would probably have little appeal. It would be more likely to bring criticism. Likewise, an appeal of the sort that implies "this will be good for the crick in your back" will not bring results. The appeal must be sincere, informative, realistic, and to the point.

Coming now to item number two, the schedule itself should not be unduly long and it should have definitive application both locally and to the problem at hand. The question should be clear and the mailing data timely. No questionnaire should prompt a reaction like the cartoon which appeared during the mid-war years. The scene pictured a farmer and his wife sitting around the livingroom table in the evening. The wife had just opened a letter and was saying to her husband, "It's from the government, Pa. It's about that plow you ordered. They want to know what you're going to use it for."

The mechanics of obtaining responses are pretty much a separate consideration. One thing seems important—it should be readily possible for one who is willing to serve as correspondent easily to identify mail originating from the crop-reporting office. Use of window envelopes with the individual's name on the schedule has proved a stimulant in some cases. One of our offices sends out a simple "pre-survey" card reminding the folks that in about a week they will receive an important inquiry form and that it will be appreciated if they will fill out the inquiry and return it promptly. Placing of special words on the envelope or on the schedule, such

as "Urgent," "Answer Requested," "Please," "Special Crop Inquiry," etc., make their own special appeals. During the war the Colorado office stamped the outside of the envelope with "War Emergency Makes It Important That You Return This Inquiry Regarding Food." The immediate response to this appeal was tremendous. (Even using this stamp on inquiries going to broom-corn growers didn't seem to minimize its usefulness.) The significance of this particular phrase was that it had strong appeal because it was tied to an important cause. Others can be devised to meet current conditions, and although they may not have the strength of appeal the war had, at least they will make individuals feel a personal responsibility in giving a complete reply. Appeal to what is sometimes called "sweet economic reasonableness" is unlikely to be effective in dealing with rural folks.

We come now to item three which to me is the most important phase of this work and one that needs the most attention by the most people—the educational phase. The discussion so far should have made clear that a small organization like the present crop and livestock estimating organization cannot cope with the broad-scale need for education in this field. It is a job for many. Farmers and ranchers themselves are the main source of accurate information regarding crop and livestock production in its various phases. It would seem therefore that the matter of cooperating in a phase of work which has such an important bearing on agricultural problems should be emphasized in the educational system, including the rural schools. There should be a place for emphasizing the need for farmer assistance in this work in the vocational agricultural program, the college economics courses, and in the program of the Extension Service. It would seem to be as important that a farmer or rancher learn through his educational process about the part he can play in developing facts about his industry as it is that he know how to farm well or how to manage livestock intelligently. Personnel of government action agencies, who frequently hold meetings with groups of rural people, should emphasize this point. This might well be an important phase of the educational program of the Extension Service.

Officials and directors of commodity group organizations, such as potato, sugar beet, wool growers associations, should be requested to call the attention of their membership to the importance of returning the inquiries they receive, from which important economic

facts bearing on their commodity are developed. The importance of this action should be brought to the attention of leaders of the large farm organizations. We have worked with all these groups in Colorado with considerable success, but this matter needs to be frequently emphasized. The importance of returning these inquiries which are the fact-gatherers for the agricultural industry won't go across in one easy lesson. It must be emphasized by repetition, much like the Negro preacher who, when asked why he was so successful in getting many conversions, replied, "First I tells 'em what I'se gwine to tell 'em. Then I tells 'em. Then I tells 'em what I told 'em." So it is with the educational process of increasing mailed inquiry returns. It must be emphasized in spring, summer, fall, and winter. A principle of salesmanship is that you can sell a commodity if you can make the customer want it. Mailed inquiry returns can be increased by making the respondent *want* to fill out the inquiry or through making the reminder so pleasantly irritating as to insure a return for the sake of gaining a clear conscience.

Persons of all government agencies which contact farmers should say a good word for the mailed inquiry. Since all need the facts which these inquiries develop, all will benefit from the results. Good percentage response, in addition to making the data more authentic, will cut costs and cut wear and tear on brake linings of rural mail-carrier automobiles. There should be a joining of hands on the part of all groups that have an interest in and a need for these basic facts.

Careful thought should be given to current and future needs for factual information. Many times in the past there has been demand for historical data which, because they were not currently compiled, were gone forever. With this lapse of time any facts developed subsequently would of necessity have to be of the "crystal ball" nature.

In many respects a nickel's worth of statistical-gathering machinery is available to cope with a dollar's worth of problems which need reliable statistical and economic facts for intelligent solution. It would seem, therefore, that for the present at least the best alternative is to continue to make the mailed inquiry effective and to improve its results as much as possible. (Here again let me point out that some of the usefulness and advantages of the mailed inquiry could not be exceeded even with expenditures of large sums of money.) Recognizing the democratic principle embodied in use of the mailed inquiry to the voluntary reporter, and the assurance

of continued large rewards, the helping hand of all agencies should be extended in its support and improvement.

DISCUSSION

R. K. SMITH

Bureau of Agricultural Economics

More and more, efforts have been made to improve on the many phases of mailed sampling techniques. This has led to research in sampling by mailed inquiry along the following lines:

- (1) Design of questionnaires
- (2) Characteristics of respondents and factors affecting response
- (3) The use of controlled and semi-controlled mail sampling
- (4) Techniques involving repeated mailings and follow-ups

(1) *Design of questionnaires.* One of the principal faults of many questionnaires is that there is so much to ask and explain that the printing has to be extremely small to get it all on the schedule.

When the proposal to shift the Prices Received schedule to larger type was made, a method for testing response was set up in four mid-western states. One group received the old type schedule and the second the new which is set with larger sized type and in which much of the explanation appearing on the old type schedule has been eliminated. New respondents were also separated into two groups and sent the two types of schedules. So far the record of returns from the two questionnaires indicates no significant differences as to the rate of returns between the new and the old for either the regular reporters or for the tryouts.

Another experiment has been tried in Tennessee and Kansas involving the Prices Received questionnaire. This questionnaire is rather long; it contains about 50 questions on prices and goes each month to buyers of all kinds of farm products. Often a particular reporter handles only a few of the items covered. Four short separate questionnaires were designed, with the commodities grouped so that the respondent on a particular list would be handling most of the commodities on which prices were asked. The results have been carefully analyzed and in neither state does the "T test" indicate a significant difference between the prices reported on the regular schedule and those reported on the split schedule. The percentage of return from the split questionnaire was higher but in terms of total number of price quotations per questionnaire mailed the regular inquiry was more efficient. Generally, it resulted in a larger number of price quotations for a particular item than did the short schedule.

It has been found that often leading questions relating to some general item or items will have pulling power and will encourage returns from reporters who have few or none of the items being sampled. For a long time many of the special surveys used by Agricultural Estimates have carried questions of a general nature, primarily for their pulling power. Obtaining reports from the so-called "zero" reporter is of utmost importance in mailed sampling.

"Fatigue" in reporting has been generally accepted as a major influence in response, both on mailed and interview surveys. Some recent explorations into this field reveal that response is not always closely correlated with length of questionnaire. It is evident that the "interest" factor is a major influence in offsetting fatigue.

Tests on the effect of using airmail for sending and returning schedules showed a significant difference in the rate of response when airmail was used. The gain in one instance when airmail was used both out and back was as much as 30 percent.

Back in 1940 Illinois tabulated 26 percent of the number of questionnaires mailed for an August cattle on feed survey. That inquiry contained only five questions; it was mailed to a developed list of reporters. Contrast this with the returns of 72 percent from the July 1, 1949 cattle on feed questionnaire in Illinois which contained 32 items. We need more research into response on questionnaires that yield a high return.

(2) *Characteristics of respondents and factors affecting response.* A number of studies have been made on differential response to mailed inquiries, especially in connection with controlled and semi-controlled mailed sampling. Analysis made of the returns from a controlled mail survey on livestock showed significant differences in response, with farms having large numbers of cattle more likely to reply than those having small numbers. For hogs, however, farm operators with large numbers were less likely to respond. On this same survey it was found that response varied according to age of the operator, with the middle age groups showing the highest rate of response. A mailed survey in January 1948, on livestock, grain stocks, and tractors revealed a tendency for "farms with no tractors" to respond. In delving more deeply into the problem of response, more work needs to be done on studies where social and economic status of the reporter is associated with response.

(3) *The use of controlled and semi-controlled mail sampling.* Various interview surveys made in January 1947 and in April and September 1948, provided the basis for controlled mailed sampling for five surveys dealing with electricity, livestock, grain stocks, tractors and meat curing. In some of these surveys returns from mail inquiries so closely represented the parent sample on certain check or control items that no special adjustments for differential response were needed. For other items the response was selective and adjustments were needed.

In semi-controlled mailed sampling, certain data, which have a high correlation with the item or items to be estimated, are abstracted from the State Farm Census or other major surveys, for each prospective respondent who is to receive a mailed inquiry. It is possible, therefore, to determine beforehand how well the sample reflects the universe by comparing averages of the control items for the sample, with averages for the same items from the State Farm Census or other major survey from which the sample was drawn.

Our experience in using this method has been exceptionally good. Analysis of the control data for the mailed returns supports the general belief that crop reporters are a selective group.

(4) *Techniques involving repeated mailings and follow-ups.* Studies have been conducted to determine the effects of repeated mailing and follow-up techniques on sample averages. The Wyoming Livestock Loss Survey discussed by Mr. Knutson showed that the sample of nonrespondents had smaller losses on the average than those who replied. In general, the first wave of returns from a survey on a specific item tends to include reports from individuals who have something to report and who are most interested in the subject. Those with small numbers, or those having none, are inclined not to send back the questionnaire. Repeated mailings or follow-ups encourage a response from those who failed to return the first questionnaire received. In some cases each follow-up return progressively yields a smaller average, thus tending to lower the average for the entire survey.

Data from repeated mailings tabulated separately for the purpose of studying response show that in many cases the percentage response to a second request is as large or larger than from the first mailing.

There is a study on use of special envelopes that is just starting which will be of interest to this group. Mr. McCandliss of our Mississippi office has designed a special, distinctively marked outgoing and return envelope to be used for our General crop surveys. With the permission of the Post Office Department the effect of these envelopes will be tested in five states during the next few months. It is hoped that the envelopes will (1) increase the total response and (2) cause replies to be returned more promptly. Both of these hypotheses are to be tested.

Conclusions

There are other illustrations of new developments in mailed sampling which have not been mentioned. Some studies and sampling schemes have been covered only briefly and others omitted because they closely resembled those presented.

In reviewing the progress one might conclude that great strides have been made in the field of mail sampling. But the surface has been barely scratched. It is folly to conclude that the results of a set of experiments derived from one survey or on one subject apply equally well to other surveys or other subjects. Each of the surveys, each of the subjects, each of the commodities have their individual problems in response, in sampling methods, and in treatment of data. These problems need to be solved by a process of continuous investigation along all lines.

These new approaches in mail sampling, however, point up the importance of "follow-up" practices. They show advantages to be gained by systematic repeat mailings and separate tabulations. Not much has been done on follow-up interviews of nonrespondents to mailed inquiries such as was done in the Wyoming Livestock Loss Survey.

Experiments show that there are ways to improve response to the mailed inquiry. Dwindling returns should be not the inevitable consequences of mail sampling. New schemes need to be tried and newer ideas developed. More than that, tests must be continued to find the factors associated with response and the best design for mail questionnaires.

WINTER STORM LIVESTOCK LOSS SURVEYS IN WYOMING

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THE Western States were besieged by storms and subnormal weather during the months of December 1948, January and February and until mid-March of 1949. Wyoming experienced its worst storm on record during the period of January 2, 3 and 4. During this storm, wind velocities reached 68 miles per hour, temperatures dropped to eight below zero, coupled with snow. Highways, byways, and railroads became blocked with snow drifts varying in depth from a couple of feet to as much as 15 feet.

Another storm, of somewhat lessened intensity, occurred in February in the Red Desert Area, embracing Carbon, Sweetwater, and Natrona Counties. During this storm wind velocities attained a maximum speed of 75 miles per hour. Temperatures were below zero and snow fell during the storm. The highways and railroads were blocked for an 11-day period because of ground blizzards.

The first blizzard encompassed a very wide area in the eastern part of this state. Eleven of the 23 counties of the state became snow-bound. There appeared to be two vortices in this storm. One centered around Cheyenne, and the other at Van Tassel, which is close to the northwest corner of Nebraska.

Shortly after the storm broke it became manifest that there would be a severe loss to livestock and wild game on the plains. Some animals froze to death, others were smothered by ice closing the nostrils, appendages were frozen, which in some cases made it necessary to destroy the animals. The economic loss to breeding animals was believed to be great and mounting daily. Unofficial estimates of losses took on huge proportions. Some unofficial estimates of the number which perished in the blizzard were as high as 50 percent of the cattle and 75 percent of the sheep. Our office was besieged by the press, stockmen, lending agencies, and others who wanted information on death losses. The wild rumors of losses suffered was giving the state considerable adverse publicity. As time went on the pressure for exact information as to the death losses became increasingly great.

The Bureau of Agricultural Economics is charged with the responsibility of collecting and publishing significant statistics of the

livestock industry. These statistics not only include estimates of the number of livestock on farms and ranches at any given time but also many other factors that influence the livestock population. Estimates of death losses to livestock and other storm damage affecting livestock fall into this category.

Frequently the residual effects as shown by subsequent poor condition of breeding animals, forced marketing due to injuries, and reductions in the calf and lamb crops are of far greater importance than the immediate death losses due to the weather phenomena. However, the great variation in the publicity as it affected the livestock industry required that an early survey of losses be undertaken.

During December the comprehensive annual Rural Carrier Survey of livestock on farms is completed. This survey is the basis for the official Department estimates of the livestock population as of January 1. Completed questionnaires are received from many hundreds of farmers and ranchers—reporting their own livestock numbers. It was decided that a short concise storm loss questionnaire would be mailed directly to each of those operators located in the storm area who responded in the Rural Carrier Livestock Survey. The primary purpose of the survey was to obtain a rough estimate of the level of losses in order that any contemplated action programs could be planned with a reasonable degree of accuracy. As only about three weeks had elapsed between the January 1, livestock population estimates and the date of the storm loss questionnaire, it was felt that memory bias would not be a significant factor.

The storm loss questionnaire was extremely simple in that the respondent was asked to report: (a) the number of all sheep and lambs he had as of January 1, (b) the number that had died due to the storms during the month and (c) the number of additional losses he expected to have because of the storm. In the case of cattle the same three questions were asked but, in addition, the respondent was asked three additional questions about his 1948 calves. This latter separation was made because of persistent reports that yearlings and other young cattle had suffered more extensively than older stock.

The questionnaire was mailed during the period January 24-28 and the survey closed on February 7. The computed percentage death loss was then applied to the January 1 population of cattle

and sheep to produce an estimate of the actual loss in terms of number of head. The loss survey results were published in an official release by the Department of Agriculture on February 10, 1949. The significant data by states are as follows:

TABLE 1. LIVESTOCK STORM LOSSES UP TO FEBRUARY 1

State	Cattle		Stock Sheep ¹	
	Percent Lost	Head Lost	Percent Lost	Head Lost
South Dakota	1.6	16,000	2.5	13,000
Nebraska	2.6	46,000	7.0	23,000
Wyoming	3.0	16,000	4.8	49,000
Colorado	.8	3,000	.5	2,000
Total Storm Area	2.0	81,000	5.8	87,000 ²

¹ Excludes sheep and lambs on feed

² An additional 10,000 head was estimated to have been lost in the fringe storm areas and in feed lots.

The foregoing summary of storm damage did not mark the end of the winter livestock losses in these western states. During the month of February additional storms harassed the area and were particularly severe in the south central and southwestern counties of Wyoming. This area comprises in part the very important winter sheep range known as the "Red Desert."

In the early part of April funds were made available for a comprehensive livestock loss survey in Wyoming. This state was selected because of its nearness to the center of the storm area and because of a demand from Wyoming farmers, ranchers, and state officials for a final comprehensive appraisal of the winter storm damage to the livestock industry. Reports were again persistent that sheep losses during February had been very severe and that the calf and lamb crops would be greatly reduced.

My office is fortunate in that it has available a nearly complete list of names and addresses of farmers and ranchers in the state. The second livestock loss survey sample was designed as a combination mail and non-response interview procedure. The mailing procedure required that one mailed follow-up be sent to each farm or ranch operator who failed to respond to the original questionnaire. The follow-up questionnaire was accompanied by a letter soliciting a response. After the returns from the follow-up questionnaire were collected a sample of non-respondents were selected for personal interview. The original mail sample was drawn at random and stratified by counties proportional to the number of livestock farms

in the county. The area to be surveyed under this procedure included 14 eastern and central counties of the state. In addition a somewhat smaller mailed sample was allocated to the remaining non-storm counties. This latter procedure was included to permit comparisons of losses in storm versus non-storm counties and to permit inclusion of statements concerning the entire state in the report of winter livestock losses.

Past experience tells us that the winter and spring livestock loss in Wyoming seldom exceeded about two percent of the cattle and six percent of the sheep on farms and ranches January 1. Thus with such relatively small figures, it was desired to design a sample to yield a percentage loss estimate with a standard error of 0.5 percent. The standard error from a random sample of n farms is given by

$$(a) \quad S\bar{x}^2 (= s)^2 \left(\frac{1}{n} - \frac{1}{N} \right)$$

in which s = an estimate of the standard deviation of the individual farm death loss percentages and N = the number of farms in the universe. It was estimated the standard deviation would be 15 percent. Thus

$$(b) \quad (15)^2 \frac{1}{n} - \frac{1}{7,300} = .25$$

The desired sample size was computed to be approximately 900 farms or ranches.

In order to assure that the mailed response would reach the desired 900 farms and ranches a stratified random list of approximately 4,000 names was drawn in the 14 counties. In addition a stratified random list of approximately 2,000 names was drawn in the non-storm counties.

In the planning stages it was decided that the non-response interviews should be taken at the rate of about 10 per county allocated finally on the basis of the percent non-response and total number of farms by counties. As the survey developed, the amount of available funds and shortage of operational time would not permit the interview of the desired 140 non-respondents. The great distances between ranches required that the number of non-response interviews be limited to a maximum of 125.

The non-response interviews were allocated by making the number of such interviews proportional to the product Px , where P

is equal to the percentage of Census farms in the County, and x is equal to the percentage non-response. On this basis the minimum number of non-response interviews allocated to any county was five and the maximum 20.

Because of time limitations the program of field operations was very rigid. The loss questionnaire was first mailed out on May 9-10, with the follow-up circularized on May 18-19. The non-response interviewing started May 31 and ended June 4. This very short period did not allow full benefit from the follow-up mailing. However, the return from the mailed questionnaire was believed to be fully satisfactory although it did not quite reach the optimum number of 900 reports. On June 4 slightly less than 800 returns had been received. Late questionnaires received after the closing date for the survey have increased the return very close to the computed sample size. The non-response interview sample had about the same degree of incompleteness as the mailed sample. A total of 89 interviews were secured in five days—a period in which field work was seriously hindered by constant rainy weather. In a number of instances non-respondent farms could not be reached because of washed out roads. Without a definite procedure for repeated visits to locate absent respondents, it is doubtful that the non-response interviews would have exceeded 100 even with most favorable interviewing conditions.

Of necessity, the questionnaire used was rather complex and lengthy, considering the fact that we were interested only in live-stock death losses. In order to hold to a minimum the memory bias usually experienced in obtaining information on livestock at some past date, such as January 1, it was necessary to frame the questions so that a January 1 inventory number could be derived from each report based on questions relating to births, marketings and deaths taking place since January 1 and on inventories at the time the loss questionnaire was filled out. Because losses from other causes, particularly to the new calf and lamb crops, are usually high, steps were taken to sort out losses to 1949 births. Provision was also made to give the respondent an opportunity to report losses due directly or indirectly to the winter blizzards, and to report on the number of cattle and sheep marketed because of injuries suffered during the storm.

In the expansion procedure the averages from the mailed survey were allowed to represent respondents while the non-response interview averages represented non-respondents in the universe. These averages were weighted to arrive at a single statistic for ex-

pansion purposes. In all cases the non-response interview sample provided a downward adjustment in the averages. It was found that non-respondents generally had no losses or lighter losses from the storms than did those operators who had responded by mail. In the analysis the first procedure was to expand the livestock population data to an independent estimate of all livestock on farms as of January 1. This would permit a comparison of the loss survey results with the official State estimate as established by the comprehensive Rural Carrier Survey, which series in turn is based on U.S. Census data. The expansion of the survey data for cattle inventories as of January 1 departed from the official estimate by 6,000 head—about one-half of one percent. In the case of sheep the sample was not quite as accurate with the survey result exceeding the official estimate by about three percent. This departure between cattle and sheep was not unexpected since the sample design was based primarily on the distribution of cattle farms.

Using the cattle data the actual expansion to the January 1 estimate of all cattle on farms follows:

$$(c) \quad \bar{x} = \frac{(\bar{x}_r)(w_r) + (\bar{x}_n)(w_n)}{w_r + w_n}$$

where \bar{x} = Respondents average

\bar{x}_r = Non-respondents average

w_r = Estimated percentage cattle farms represented by respondents

w_n = Estimated percentage cattle farms represented by non-respondents.

TABLE 2

Strata	Ave. all Cattle Per Farm	Number Cattle Farms	Indicated Number Cattle
Storm Counties			
Mailed Sample	116		
Interviews	100		
Combined	103	7,000	721,000
Non-Storm Counties			
Mailed Sample	80		
Adjusted by Interview Ratio	70	4,000	284,000
Total Number			1,005,000 head
Official Estimate			1,001,000 head

The estimate of death losses was then derived through two independent approaches, (a) a direct expansion of the actual losses,

and (b) an estimate of the percentage loss of the January 1 inventory numbers. Again using the survey data for cattle the estimated losses were computed as follows:

TABLE 3. DIRECT EXPANSION

Strata	Ave. Loss Per Farm	Number Cattle Farms	Indicated Number Lost
Storm Counties			
Mailed Sample	6.6		
Interviews	4.4		
Combined	4.9	7,000	34,300
Non-Storm Counties			
Mailed Sample	2.7		
Adjusted by Interview Ratio	2.0	4,000	8,000
Total State			42,300

TABLE 4. PERCENT LOSS EXPANSION

Strata	Percent Loss	Cattle on Farms January 1, 1949	Indicated Number Lost
Storm Counties			
Mailed Sample	5.7		
Interviews	4.4		
Combined	4.7	686,000	32,300
Non-Storm Counties			
Mailed Sample	3.3		
Adjusted by Interview Ratio	2.7	325,000	8,800
Total State			41,000

To summarize then:

TABLE 5. TOTAL CATTLE LOSSES

Method	Storm Counties	Non-storm Counties	Total State
Direct Expansion	\$4,300	8,000	42,300
Percent Loss	\$2,200	8,800	41,000
Adopted Estimate	\$2,000	9,000	41,000

It can be noted that the Livestock Reporting Board adopted an estimate close to the result shown by the Percent Loss approach rather than the Direct Expansion or an average of both. A final estimate in even thousands was desired.

With respect to sheep losses, the same procedures were used and the following results obtained, although the data are considered to be less precise.

TABLE 6. TOTAL SHEEP LOSS

Method	Storm Counties	Non-storm Counties	Total State
Direct Expansion	121,000	37,000	158,000
Percent Loss	128,000	21,000	149,000
Adopted Estimate	125,000	29,000	154,000

Once the total losses were established several other interesting statistics became available. In the 14-storm counties the total loss of cattle was estimated to be 32,000 head (Table 5) of which respondents attributed 20,000 head directly to the storms. Of this 20,000 head, 4,000 head were reported to be 1949 calves. Thus the 16,000 head lost out of the January 1 population, as shown by the survey, finally turned out to be the same as the number estimated in the February (Table 1). The remaining 12,000 of the total 32,000 head lost in the 14-storm counties was attributed to natural causes. In the case of sheep (ewes) in the 14-storm counties, the total loss was estimated to be 121,000 head (Table 6) of which 97,500 head were lost because of direct storm causes. The data reveal that somewhat more sheep were lost in storms occurring after February 1 than were lost in the very severe January weather.

On a percentage basis these livestock losses for the state of Wyoming proved to be heavy but did not approach the unofficial estimates and speculations derived and published during and after the storm period. For cattle the average winter and spring death loss is somewhat less than two percent while the survey shows a loss of 4.1 percent for the 1949 January-June period. In case of sheep the 10-year average winter and spring loss for the state is 5.9 percent compared with the survey estimate of 7.4 percent lost during the January-June period of 1949.

The procedure utilized several of the best features of both mail and interview sampling. The cost was relatively low yet the results were timely and the data possessed many of the fundamental statistical characteristics widely claimed for interviewed samples. In livestock sampling the element of time is of utmost importance with a rapidly changing phenomena. In the case of the non-response interviewing rapport was established almost immediately upon contact since the respondent was already familiar with the survey and its purpose. This fact alone resulted in a very important reduction in interview time and reduced refusals to the point of practical insignificance.

PLANS FOR THE 1950 CENSUS OF AGRICULTURE

RAY HURLEY

Bureau of the Census

FOR many years, the periodic census was the chief official source of data concerning our farms and farm people. While other sources of agricultural data have increased greatly in importance, the Census of Agriculture is still the leading source of statistics on agriculture.

Planning for the 1950 Census of Agriculture began more than two years ago. These plans have been developed by inviting criticism, suggestions, and recommendations from a large number of persons, and by a series of pretests. The first pretests, in April 1948, included a complete census of two Missouri counties and a small-scale census in part of a township in each of 33 other areas scattered throughout the United States. The second pretest, in October 1948, comprised a complete census of four midwestern counties. The third pretest, made last May, included a complete census of two Southern counties, and a census of 64 segments having about 50 farms each and scattered among 43 states. The two most recent pretests have included a recheck by professional personnel for a sample of the farms included in the census. In all the pretests, census enumerators have been accompanied by technically trained persons who, as observers, noted the mistakes made and difficulties encountered in taking the census.

Plans for the 1950 Census of Agriculture may be conveniently outlined in three parts, namely, questionnaires, enumeration procedures, and tabulation and publication of results.

The development of the 1950 Agriculture Census Questionnaire began in 1947. At that time, the principal users of Census of Agriculture data, such as State Agricultural Colleges, State Departments of Agriculture, and farm papers were invited to submit suggestions and recommendations for the next census. From these and other users, several thousand letters containing suggestions and requests for the inclusion of inquiries in the census were received.

In determining the inquiries to be included in the coming census, dependence has been placed largely upon the recommendations of representatives of the principal users of the data. To obtain balance between various interests and to secure assistance in holding the number of questions within feasible bounds, the Director of the Bureau of the Census appointed in 1948 a Special Advisory Com-

mittee for the 1950 Census of Agriculture. This Committee was composed of representatives of agricultural publishers, State Commissioners of Agriculture, the U.S. Department of Agriculture, the American Farm Economic Association, the Grange, the American Farm Bureau Federation, the Farmers Union, and the National Council of Farmer Cooperatives. This Committee has considered and prepared recommendations concerning the numerous inquiries proposed for the 1950 Census.

The questionnaire is of the interview type. In this respect it differs from the previous record-type questionnaires. In the questionnaire most questions are stated completely and exactly as the enumerator would ask them. Experience has demonstrated that it is extremely difficult to get enumerators to understand the exact information desired and to ask the questions in such a way that they get precise information unless the questions are carefully worded and the enumerator uses the wording verbatim. Another important characteristic is the printing of the most important instructions on the questionnaire itself.

Regional or sectional questionnaires were first used in the 1940 census. In 1940 seven and in 1945 nine different regional questionnaires were used. In order to simplify the questionnaire and to obtain information on crops and other items that are important only in a single or a few states, it is planned to use 41 different regional questionnaires in 1950, each for a state or a group of two to four states.

The second part of the plans for 1950 deals with enumeration procedures. These include self-enumeration, training of enumerators, use of crew leaders, and procedures designed to improve the completeness of the coverage of the farm census.

The plan to use self-enumeration for the farm census constitutes the most important departure from field procedures used in past agricultural censuses. Through the use of post office facilities it is planned to distribute, prior to the beginning of the enumeration, to every rural boxholder, except those in a selected area in the South, a copy of the questionnaire for the 1950 Census of Agriculture with a request to the boxholder that these questionnaires be filled and given to the census enumerator when he calls.

Tests on the self-enumeration procedure were conducted in a special census in four rural counties last fall. Notwithstanding the fact that this was a special census and reporting was not obligatory, a rather high rate of cooperation was obtained. The per-

centage of the farms for which the questionnaires were filled either completely or almost completely, ranged from 39 to 51 percent. The percentage of cases in which the respondents had not filled any part of their questionnaires, so that the enumerator had to do the complete job of filling the questionnaire ranged from 42 down to 32 percent. With this rate of cooperation, the average enumeration time for all farms was reduced from about 40 minutes for the areas in which self-enumeration was not tried to about 20 minutes in areas in which it was.

In 1950, it appears reasonable to hope that about the degree of cooperation observed in the pretests can be expected in areas that have about half of the farms in the United States. In the remaining areas, in which the literacy rate of farmers is lower and the enumeration problems are more difficult, only a small gain may be realized through self-enumeration. In fact, in the multiple-unit area of the South, it is not planned to make any advance distribution of questionnaires by mail.

Plans to use sampling in the 1950 Census of Agriculture represent a significant change in procedure from that used in prior decennial censuses. Information on farm equipment, farm facilities, farm expenditures, farm labor, farm values, farm mortgages, and farm taxes will be collected for only one out of five farms, plus about 40,000 large farms. The determination as to which farms are to be the sample will be based upon whether or not the questionnaire has a specified number and the number assigned to the enumeration district. Questionnaires will be numbered from one to five and all questionnaires having a number corresponding to the last digit of the enumeration district will be in the sample. The use of sampling will reduce both the enumeration and tabulation costs for the Census of Agriculture.

Training of Enumerators

The rural enumerators will be given approximately 24 hours of training before they begin their actual enumeration. The detailed training for the Census of Agriculture will represent slightly more than one-third of the total training time. The training program will teach the enumerator the step-by-step procedure for doing his work, and will give him the essential facts he needs to know in order to carry out his assignment efficiently and accurately.

Emphasis in the training will be placed upon practice enumeration in the classroom, use of role-playing interviews, problem-

solving exercises and filling questionnaires from recorded interviews. In addition, each enumerator will be given, after the second day of training, a home assignment of preparing a questionnaire for his own or a neighboring farm. Before the last day of training the enumerator will perform one-half day of actual enumeration. Questionnaires filled at home and those obtained during the one-half day of enumeration will be reviewed, and discussed with the enumerator. The training will be continued during the first two days of actual enumeration. Present plans call for only half the enumerators to start their enumeration on the first day of the enumeration period and the other half to begin their enumeration on the following day. During the first day of enumeration for each group it is planned to have the crew leader see all the enumerators who began that day and to have him accompany, on at least one interview, the two enumerators that he considers the weakest.

The materials to be used for training of enumerators will be standardized and the crew leader will be required to follow a fixed time schedule in conducting the training. In order to reduce the monotony of the training and increase the effectiveness of the presentation of essential instructions, training materials for the Census of Agriculture will include three film strips presenting basic concepts and definitions.

It is axiomatic that the results of the census can be no better than the work performed by the individual enumerator. It is believed that the training program for enumerators will result in decided improvement in the quality of the census.

Noteworthy steps have been taken to provide for supervision of enumerators during the taking of the census. Present plans call for the use of approximately one local supervisor or crew leader for every 14 enumerators in rural areas. These crew leaders will be recruited approximately four weeks in advance of the census date. They will be given a full week of training on the requirements and the procedures of the census.

The crew leaders will conduct the training for the enumerators for whom they will be responsible during the census. Prior to the actual beginning of the census, the crew leader will spend several days inspecting the maps to be used by the enumerators, visiting the area to be enumerated for the purpose of clearing up any questions regarding boundaries of enumeration districts, and familiarizing himself with any problems that may arise during the conduct of

enumeration. During the actual enumeration period he will visit his enumerators as they are conducting the enumeration, inspect their questionnaires on a systematic basis and answer any questions that they may have. In the early stages of enumeration the crew leader will be expected to accompany each of his enumerators on at least one interview. In general, the crew leader will be expected to visit the enumerators at least twice every week and to make a detailed check of approximately 20 percent of the questionnaires they have completed. At the completion of the enumeration of a given area, a crew leader will be expected to check the work and map of the enumerators to see that the coverage has been complete. This program of supervision represents one of the most promising developments aimed toward improving the basic quality of data collected in the Census of Agriculture.

Several important steps are being planned to improve the completeness of the coverage of the agricultural census. The first of these steps relates to the kind of places for which census enumerators will be required to fill questionnaires. It is becoming increasingly difficult for census enumerators to recognize farms or places that should be enumerated in the farm census. In recent censuses, enumerators have been instructed to enumerate as farms all places containing three or more acres on which any agricultural products were produced and also all places under three acres on which \$250 or more of agricultural products were produced during the year preceding the census. Enumerators have had difficulty in applying these instructions particularly because for places under three acres it was necessary to determine the value of agricultural products. Also, in past censuses, enumerators have not uniformly applied the instructions regarding the enumeration of places of three or more acres.

For 1950, the enumerator will be required to ask for each dwelling in rural areas, "Is this house on a farm?" and to record the answer. If the answer to this inquiry is "No" the enumerator will be required to ask, "Is this house located on a place of three or more acres?" If the answer to either of these questions is "Yes" the enumerator will be required to fill an agriculture questionnaire for the place. Moreover, the enumerator will be asked to enumerate all places under three acres if locally considered as farms, and also all nurseries, greenhouses, apiaries, and places producing poultry and eggs primarily for sale.

Tentative plans are to include in the tabulations only those

places of three or more acres on which the value of agricultural products produced during 1949 amounted to \$150 or more. Special rules will need to be developed for farms being operated for the first time in 1949, farms on which all crops failed, etc. Only those places under three acres having a value of products sold of \$150 or more, will be retained in the tabulations. In order to have consistency from census to census, it is planned to vary the \$150 limit in accordance with changes in the price level.

Another important step being taken to improve the completeness of coverage is the use of lists of large farms. The criterion adopted for determining whether or not the farm is large varies somewhat from area to area, but, in general, any farm that has 1,000 acres of land, or 750 acres of cropland, or 200 cattle, or 600 sheep, or a value of products sold of \$70,000 or more is considered a large farm. A list of the large farms enumerated in the 1945 Census has been prepared and copies of this list have been sent to State Statisticians for checking against lists of farms obtained in State farm censuses, lists of large producers, lists of farms included in county soil conservation and other programs. This checking is expected to provide a rather complete and up-to-date list of large farm operators. These lists will be given to crew leaders and they will be required to check upon the enumeration of the farms included on these large farm lists. This procedure will help insure the complete enumeration as well as prevent the enumeration more than once of large farms with land in more than one enumeration district.

Two other procedures for improving the completeness of coverage will be used in the South or the West. The enumeration of "multiple-unit farms" or farms with croppers in the South has always presented serious problems. In order to improve the enumeration of multiple-unit farms, it is planned to use a special Landlord-Tenant Operations Questionnaire in the multiple-unit area of the South. This questionnaire provides for a report on the over-all operations of the multiple unit, a listing of the croppers and other tenants on the multiple unit together with the acreage assigned each and the acreage and production of the crops on the assigned land in 1949. This questionnaire is to be filled by the census enumerator before he fills separate agricultural questionnaires for each of the sub-units of the multiple unit. This procedure will aid in preventing duplication in the enumeration of parts of the multiple units and will provide data for filling the individual agriculture question-

naires in case the operator next April is on a newly assigned acreage and does not know the facts regarding the use of land, crops, etc., for the farm in 1949.

In the West, the use of grazing lands under a permit system presents some difficult problems in obtaining complete coverage of land. Inasmuch as farmers do not know the area of grazing land used under permit, and as several operators often have permits covering the same land, it has been determined that it is not feasible to include grazing-permit lands as a part of the farm or ranch. In order to insure that grazing-permit lands are not included in the farm area and to provide a check on the coverage of persons holding grazing permits, a question on use of grazing-permit lands will be included on the questionnaire for the Western States.

Widespread publicity will be another aid employed in improving not only the completeness of coverage, but also the quality of the census. It is planned to make widespread distribution of information about the census in order to prepare persons for the visit of the census enumerator. The distribution of the Agriculture Questionnaire and its accompanying letter by mail prior to the beginning of the enumeration will contribute greatly to the knowledge of persons living in rural areas regarding the census.

Tabulation and Publication of Results

Present plans call for the tabulation of all items except those obtained only for a sample of farms by minor civil division. Data obtained on a sample basis, except those for farm mortgage debt, farm wage rates, and farm taxes would be tabulated by counties. These tabulations would provide totals for most items for each county and it is planned to publish such county totals. Tabulations and published county totals would provide separate data on farms and crop acreage and production for irrigated and non-irrigated farms in the Western States. Data on land use, the acreage and production of principal crops and on the number of the important kinds of livestock would be available by minor civil division, and such data would be made available, as in past censuses, upon the payment of the cost of making photostat copies of the tabulations.

It is planned to tabulate and publish a considerable amount of data for areas larger than counties. All the cross tabulations by size of farm, color and tenure of farm operator, type of farm, and economic class would be made and published for groups of counties comprising type-of-farming areas. These type-of-farming areas

would be essentially those developed by the Bureau of Agricultural Economics in cooperation with State Colleges.

The classification of farms by size and by color and tenure of operator has been made for several prior censuses. The proposed classification of farms by type of farm and by economic class differ considerably from those made in prior censuses and a description of these classifications appears desirable.

The first attempt of the Bureau of the Census in classifying farms was made in connection with the 1945 Census of Agriculture. Several changes in the 1945 bases for the economic classification of farms are being considered for the 1950 Census. The value of farm products sold instead of the gross value of farm products sold and used by the farm household as the major criterion for the determination of economic class has already been decided upon. In the 1945 experimental classification, the characteristics of farms in the part-time, residential, and small-scale classes do not differ greatly. The proposed inquiries regarding the relative importance of farm and nonfarm sources of income will aid in a more accurate separation of part-time and small-scale farms in 1950.

Changes in price level require also an adjustment in the 1945 criteria for the economic classification of farms in order to provide more adequate comparability through time. Value of sales in terms of dollars fluctuates considerably from census to census because of changes in price levels and yield conditions. This will be partially remedied by change in the 1945 value-of-products criteria.

At the present time the tentative economic classes of farms and the criteria to be used are as follows:

Economic class	Value of products sold	Days of work off the farm by farm operator	Income from non-farm sources greater than value of farm products sold
Commercial farms			
Group A	\$25,000 or more	—	—
Group B	\$12,000-\$24,999	—	—
Group C	\$ 5,000-\$11,999	—	—
Group D	\$ 2,500-\$ 4,999	—	—
Group E	\$ 1,000-\$ 2,499	—	—
Small-scale farms	\$ 200-\$ 999	Less than 100	No
Part-time farms	\$ 200-\$ 999	100 or more or	Yes
Residential farms	Under \$200	—	—
Abnormal farms	This group would include institutions (farms operated by schools, colleges, Federal, State, and local Governments), country estates, and other farms with no farm products sold.		

The classification of farms by type will be made only for those farms that have been classified by economic class as commercial farms, small-scale farms, and part-time farms. Residential and abnormal farms will not be classified by type.

In general, type of farm will be determined on the basis of the relationship of the value of farm products sold from one source to the total value of all farm products sold. Generally, the source accounting for 50 percent or more of the total sales will determine the type. Tentative plans call for the establishment of the following twelve types of farms:

Type of farm	Criteria
1. Cash-grain farms	50% or more of total sales derived from the sale of corn, sorghums, and small grains.
2. Cotton farms	50% or more of total sales derived from the sale of cotton and cottonseed.
3. Crop-specialty farms	50% or more of total sales derived from the sale of a single field crop other than corn, sorghums, small grains, cotton, vegetables, and fruits and nuts.
4. Vegetable farms	50% or more of total sales derived from the sale of vegetables.
5. Fruit-and-nut farms	50% or more of total sales derived from the sale of fruits and nuts.
6. Poultry farms	50% or more of total sales derived from the sales of poultry and poultry products
7. Dairy farms	50% or more of total sales derived from the sale of dairy products, dairy cattle and calves.
8. Livestock-specialty farms	50% or more of total sales derived from the sale of one kind of livestock such as sheep (including wool), cattle and calves (other than dairy) or hogs.
9. General-crop farms	Less than 50% of total sales derived from any single source (such as cash grains, cotton, etc.) but 70% or more of total sales derived from the sale of all crops.
10. General-livestock farms	Less than 50% of total sales derived from the sale of poultry, dairy, or livestock-specialty products, but 70% or more of total sales derived from the sale of all livestock and livestock products.
11. General-crop and livestock farms	Less than 50% of total sales derived from the sale from a single source but with less than 70% of the total sales derived from the sale of crops and less than 70% of the total sales derived from the sale of livestock and livestock products.
12. Miscellaneous farms	This group will include farms not included in the other 11 groups and will comprise such types of farms as forest products, horticultural-specialty, fur farms, etc.

The publications planned for the next census will contain an appraisal of the results of the Census of Agriculture. This appraisal

will be based, in part, on a recheck of the enumeration of a sample of 6,000 to 8,000 farms. This size of sample will be sufficient to provide an accurate evaluation of the completeness of coverage within one percent of the total number of farms. This recheck will not only provide estimates of the completeness of coverage of farms and land in farms but also furnish data that will help evaluate the accuracy of other important items.

The appraisal will also deal particularly with the comparability of various items for several censuses. It will include a discussion of the incompleteness of the enumeration, where this is known to exist, the extent of any estimating involved in presenting the final results, and the basis on which any such estimates were made.

It is believed that this appraisal will help overcome technical criticism of the census and will lead to much more accurate use of its results. It is hoped that self-criticism and analysis of the accuracy of the census will gain for it a higher standing among research and scientific workers.

DISCUSSION

P. J. CREEP

Montana State Statistician

As one who appreciates the value of census data, I am pleased with the opportunity to express some observations regarding the plans for the forthcoming census of agriculture disclosed by Mr. Hurley.

State statisticians are interested in the 1950 Census of Agriculture from the viewpoint of type of information to be enumerated, completeness and accuracy of the recorded data and coverage of the farms and ranches of the state. Basic to these points are the design of the questionnaire, enumerator selection and training, methods of enumeration and checks and measurements of coverage. The following observations place emphasis on these points.

The interview type of questionnaire to be used for the forthcoming census of agriculture is a marked improvement over the record type questionnaires used in the past. Questions worded in a simple, clear and descriptive manner should draw from the respondent correct answers for most items. The Census questionnaire used in the May 1949 pre-test has undergone considerable modification in layout as well as wording of questions. The final draft, with many sections shifted to other positions, will present better sequence of the questions relating to similar subjects.

Narrow regionalization of the questionnaire greatly reduces the number of questions to be considered. This will contribute to the accuracy and completeness of reported information and also lower enumerative costs.

Much of the accuracy, completeness and coverage of the enumeration rests with the type of enumerators used and the kind of training they have. Rather intensive studies have been made of the performance and quality of work of interviewers. Young women raised on a farm or who had lived on a farm for several years proved to be the best interviewers. Enumerators with farm backgrounds would be more likely to cover all farms and ranches in the district than enumerators from the city whose travels seldom take them off State and Federal highways.

Modification of the questionnaire from the record to the interview type has an additional advantage of permitting self-enumeration. Questionnaires are to be distributed through the mail to farm and ranch operators and in due time the enumerators will contact the operators, check through the questionnaires for accuracy and completeness and fill in information not already recorded.

Widespread publicity is to be given the Census to improve its coverage and quality. In the course of this publicity it may be effective to request that operators who do not receive questionnaires by mail at a specified date appear at a designated office and obtain questionnaires for self-enumeration.

Mr. Hurley has outlined the plans to assure more complete coverage of multiple unit farms and also those which use grazing lands under a permit system. A large portion of the land in western states is operated under rental agreements and many farms are comprised of two or more tracts of land which may be widely separated. If complete coverage is to be obtained, it may be necessary for enumerators to account for all of the land within the borders of their districts by thorough mapping.

Constant changing of land from one operator to another induces a problem in the enumeration of land use and crop information in western states. This problem was recognized and discussed by most of the observers of the May 1949 pre-test. The first question under the land use section of the questionnaire asks for "acres in this place" which are to be the same as the acres in the operator's charge at the time of the enumeration. This acreage is also to be the same as that covered in the land use categories for the year 1949. Included in the land use section is a question asking for acres of land from which crops were harvested in 1949 and these acres are expected to be the same as the total of the acres entered under the crops section of the questionnaire. There will, undoubtedly, be many cases in Montana and other western states where land operated in 1949 will differ from the land in the charge of the operator next spring. Mr. Hurley has indicated that by use of a special landlord-tenant operations questionnaire the enumeration of multiple unit farms in the south may be improved. It would be well to use a similar questionnaire in most of the western states.

The mid-decennial Census of Agriculture timed as of January 1 eliminates much of the confusion of shifting acreages in farms and also reduces the amount of memory bias. Furthermore the majority of farmers and ranchers operate on a calendar year basis. They have on hand January 1 livestock numbers, totals of income and expenses and other data for income tax purposes. These data would be useful and timely in filling out the census

schedule. Thus a January 1 enumeration appears to have many advantages over the 1950 enumeration date which is to begin April 1.

During recent years the need for good irrigation statistics has increased sharply.

The irrigation section of the 1950 census questionnaire does not provide for a listing of acreage and production of crops for which part of the acreage was irrigated in 1949.

The livestock industry in western states is comprised principally of large scale ranching operations. With the census enumeration timed for April 1, 1950, enumerators should be able to locate owners or operators at their home place. Reference to assessor's records and also to files of the various Federal agencies controlling public domain will, undoubtedly, be helpful in obtaining complete coverage of western livestock operations.

DISCUSSION

JOE R. MOTHERAL

A & M College of Texas

My interest is centered on research uses of Census data, so I should like to mention three of the most important values of the Agricultural Census to the researcher.

First, the Census is highly suggestive of problem areas in the agricultural economy and is therefore influential in the formulation of research projects. Second, it is logically and widely used as a sampling base for intensive studies. And third, it provides a check every five years on those studies which are concerned with trend analysis. For these reasons, and because the Census is an established public undertaking of rather sizeable proportions, the agricultural economist tends to assume a proprietary attitude toward it and to reserve unto himself the privilege of full, free, and perhaps at times noxious, criticism of the methods pursued by the Bureau of the Census in collecting, processing and publishing its data.

In his paper Mr. Hurley implicitly accepts this universal tenancy in common and enumerates the ways in which his Bureau has encouraged it, to the end that a more acceptable and useful product may be the result. A deliberate effort has been made to obtain the advice of representatives of the farm organizations, the agricultural press, and the state commissioners of agriculture.

It is the thesis of these comments that while the agricultural economist is correct in asserting his right to criticize Census techniques, he has the responsibility of contributing to their improvement. We have accepted the right with greater alacrity than the responsibility. A case in point is the matter of enumerating the multiple unit, or plantation, in the South. Most Southern agricultural economists yield to no region in their condemnation of the traditional Census classification of farms. Some consider it simply to be an anachronism which the Bureau is unwilling to discard, others as a concession to easy enumeration; and there is one steadfast group which

takes the dark view that it is sheer discrimination resulting from the indecisive nature of the Confederate victory in the Civil War.

In 1910 the Bureau of the Census offered a partial remedy in the form of a report entitled "Plantations in the South" which summarized data for farms having five or more tenants. A plantation schedule was used in 1940, but the results were evidently unsatisfactory, as the data have not been published. Again in 1945 an attempt was made to collect and summarize information on "Multiple Unit Operations." Among the other limitations of this material is that of lack of comparability, for the definition of a multiple unit in 1945 involved *any* operation consisting of two or more sub-units including those of cash, standing rent, and share tenants.

Since 1945 the Bureau has made a strenuous effort to overcome this deficiency in time for the 1950 Census, as those of us who assisted in the field pretests can testify. However, it is an open question whether the schedule presently proposed for 1950 will do the job.

Admittedly, the solution to this problem is not simple. It requires a reconciliation of the intricate characteristics of the Southern tenure system, on the one hand, with the pressing limitations of time, schedule space and the capacity of the Census enumerator on the other. Most Southern agricultural economists, I believe, need to have a clear-cut enumeration of operating units which would be meaningful and uniform for the region, and which would assure comparable data from one Census to the next.

An admirable illustration of how to hold a firm grip on this statistical cake, while eating it, has been furnished by the summarization of farms into "economic classes." This exceptionally useful classification required no modification of existing methods of enumeration and hence involved no breach in continuity. Yet it represents an adaptation that meets a long-standing need for students of significant trends in the agricultural economy. It is worth noting that the proposal for this addition to Census material originated outside of the Bureau but was readily accepted and incorporated into the 1945 Census.

The final objective of the consumer of agricultural statistics might well be an annual census with sufficient coverage to provide reliable data for small areas. Considerable progress has been made toward such a goal during the last few years.

DISCUSSION

R. S. OVERTON

Iowa Field Office BAE.

The Census Bureau is to be highly commended for their energetic efforts to make extensive improvements in all phases of their work. In conjunction with their program of inviting assistance from outside sources, the Census people themselves have aggressively tackled their problems with the view of adopting or devising new techniques that would improve the quality and utility of their data.

Several specific improvements should be cited. One of the most impor-

tant is the nearly complete regionalization of questionnaires on a state basis.

Another change in the procedure is the standardized training program that has been worked out. The combination of film strips and recordings is a significant step toward uniformity and should go far toward improving the reliability of the census enumeration.

The proposed self-enumeration plan is basically sound and represents another achievement.

The Bureau is making every effort to formulate realistic classification and type criteria that will maximize the value of the tabulations. These standards have not yet been fixed and since the Bureau is inviting comment it would seem that there still is an excellent opportunity for all of us to offer constructive advice as to how we would like to see the results published.

In the future, I would like to see a census study committee, composed of personnel from B.A.E., P.M.A., the state colleges, the State Department of Agriculture, the Extension Service, business groups and representatives of farm organizations set up in each state. This group would function much the same as the national advisory committee except that they would be concerned with the work in a particular state.

The time of taking the Federal Census of Agriculture needs to be re-examined. In my opinion the information should be obtained in December or January, at least it should be as close to the first of the years as possible. Obviously there are some drawbacks to an earlier enumeration, but I feel the advantages outweigh the disadvantages.

It is my opinion that dollar value figures are still regarded by rural people as highly personal information and they resent being questioned about them. Further, many crop share tenants do not know how much their landlord received from the sale of his portion of the crop. In short I am rather dubious about all of these "values of sales" questions and I would like to raise the point that their inclusion may result in serious downward bias in the reported figures of both dollar values and units sold. This influence may go even further and tend to distort reported production figures.

**PROCEEDINGS OF THE ANNUAL BUSINESS MEETING
AMERICAN FARM ECONOMIC ASSOCIATION
LARAMIE, WYOMING, AUGUST 20, 1949**

President O. V. Wells called the meeting to order at 8:30 A.M. He asked for the reports, in turn, of the Committee of Election Tellers, the Secretary-Treasurer, the Auditors, and the Editor. These reports were presented and are appended. A motion to accept these reports was approved.

President Wells reported the arrangements for joint meetings with the American Economic Association and related organizations in New York in December.

The President announced the appointment of a committee consisting of A. J. Brown, M. C. Bond, and D. Barton DeLoach to cooperate with the American Marketing Association.

Wells reported that he had been unable to form a committee to make special awards at this meeting. Several prominent members were asked, but refused, to serve as chairman of such a committee. However, E. C. Young, Warren Waite, and F. V. Waugh served as a committee to make recommendations as to procedures for making special awards.

The President discussed the prospective deficit in the Association's budget for the current and next fiscal years. He pointed out that publishing the JOURNAL is the greatest item of expense but advised against reducing the size of the JOURNAL. The executive Committee has authorized the publication of 1,200 pages, including 400 pages for the proceedings of the annual meeting.

Several members spoke of the necessity for the Editor to cut proceedings papers to fit the limited space in the JOURNAL. There was no dissent.

A motion to supply authors with reprints of proceedings papers at cost was approved.

A motion to charge a registration fee of not less than one nor more than two dollars at future annual meetings was approved.

The President discussed the need for greater continuity of officers in the management of the affairs of the Association. He gave special emphasis to the need for some specific preparatory experience for the President. In order to provide for such experience, the Executive Committee recommended the adoption of the following amendment to the Constitution.

Article IV

Organization. The officers shall be a President, a *President-Elect*, two Vice-Presidents, and a Secretary-Treasurer, who shall be elected for one year, and who shall serve until their successors shall qualify. In case of incapacity of the President to act, the Vice-President receiving the highest number of votes shall act as President. *The President-Elect shall be a member of the Executive Committee in full standing and automatically become President the year following his election as President-Elect.*

The Executive Committee shall consist of the active officers, *including the President-Elect*, the latest two past Presidents, and may include the President of any national or regional association with which the American

Farm Economic Association has entered into joint membership arrangements. It shall appoint annually the Editor of the JOURNAL OF FARM ECONOMICS. It may adopt rules and regulations for the conduct of its business not inconsistent with the constitution of the Association, or with rules adopted at the annual meeting. It shall act as a committee on time and place of meetings, and perform such other duties as the Association shall delegate to it.

There shall be a standing committee on investment policy with respect to Association funds. The Secretary-Treasurer shall be a member of this committee. He shall have authority to acquire, sell and transfer property for the Association. The actions of this committee shall be subject at all times to review by the Executive Committee.

The President, Vice-Presidents, and such other members as the President may appoint shall constitute a committee on the preparation of a program for the annual meeting. The President shall act as chairman of this committee.

Special committees may be appointed in accordance with the needs of the Association. Special committees and the investment committee shall be appointed by the President with the approval of the Executive Committee.

(As amended 12-28-1946)

Article V

Election of Officers. The President and the two preceding past Presidents shall constitute a nominating committee. The President shall act as chairman of the committee.

Two nominations shall be made for each office except for Secretary-Treasurer, for which one nomination shall be presented. No person who has served a term as President shall be nominated for that office or eligible for election to it. *For the year ending in 1950, the ballots shall provide for the election of both a President and a President-Elect. Thereafter the ballots shall omit the office of President.*

Not later than 30 days before the annual meeting of each year, the Secretary-Treasurer shall mail a ballot to each member of the Association who has paid dues for the current year, not including corporations, libraries, or other institutions. Said ballot shall provide for a vote for each elective officer. For each office the ballot shall contain one blank line. A brief biographical sketch of each nominee shall be included.

The proposed amendment was approved.

There being no further business to be transacted, the meeting was adjourned.

L. H. SIMERL, *Secretary-Treasurer*

REPORT OF THE SECRETARY-TREASURER

The secretary-treasurer spent considerable time becoming familiar with the duties and responsibilities of his office. Among other things this served to increase his appreciation of the work of those who performed these duties in previous years.

Membership. The strong upsurge in membership that began a few years ago apparently has subsided. Last December the secretary-treasurer reported an all time high of 2,006 members and subscribers. Our latest count, made in connection with the mailing of the election ballots, showed a decrease of approximately two and one-half percent from the last December figure.

The Association is confronted with a serious membership and financial problem. This problem has five alternative solutions. These are: (1) cut services to members; (2) finds ways of providing present services at reduced cost; (3) increase membership dues; (4) draw upon reserves; (5) increase the number of members.

A Committee on Policy faced this problem in 1948, and reported at the last annual meeting. At that time the committee, consisting of Frederick V. Waugh, Chairman, L. J. Norton and E. L. Butz, recommended against curtailing our program or raising dues and said: "Our greatest need is for new members."

Finances. From December 1 to July 30 our operating expenditures have exceeded income by \$1,086.01. In addition, we accumulated a liability for clerical services in the secretary-treasurer's office amounting to \$875. This makes a total deficit for the first eight months of our budget year of \$1,961.01.

Figures presented at the last annual meeting are not exactly comparable to these as they covered a period of nine months instead of eight. However, for the first nine months of the fiscal year 1948 income exceeded expenditures by \$1,817.76.

Thus, where we had a surplus of \$1,817.76 to September 1 last year, we have a deficit of \$1,961.01 to August 1 this year. This switch from a substantial surplus to a substantial deficit should receive careful consideration from the members and the Executive Committee.

The change from black ink to red is accounted for by increased operating costs on the one hand and reduced income on the other. Operating costs have increased with the general rise in prices, and also on account of the large increase in membership last year. The dues paid by the new members appeared as income in 1948, but much of the expense of servicing them occurred in 1949. Many of the new members failed to renew their membership this year.

A summary of our receipts, expenses, and cash balances follows:

SUMMARY OF RECEIPTS, EXPENSES, AND CASH BALANCES
DECEMBER 1, 1948 TO JULY 30, 1949

Cash balance, November 30, 1948.	\$ 6,035.16
Income	
Special grants	\$1,000.00
Dues and other income	9,253.64
Total.	\$10,253.64
	\$16,288.80

Expenses

JOURNAL printing..	\$8,985.37
Other expenditures.	1,354.28
	<hr/>
Total	\$10,339.65
	<hr/>
Cash balance July 30, 1949.	\$ 5,949.15

Investments

No changes have been made in the investment portfolio since the end of the fiscal year, November 30, 1948. At that time the investments were valued at \$61,744.85.

Special Grants Fund

The reserve for special grants amounts to \$14,425.00 plus accumulated earnings since December 1, 1948.

A summary of the financial results and membership records will be prepared at the end of this fiscal year, November 30. It will appear in the February 1950 issue of the JOURNAL.

In accord with a resolution adopted by the membership at the 1948 annual meeting the fiscal year beginning next December 1, will end on June 30, 1950.

Respectfully submitted,
L. H. SIMERL,
Secretary-Treasurer

REPORT OF THE AUDITORS

As requested by the President of the American Farm Economic Association, we have examined the accounts of the Secretary-Treasurer, L. H. Simerl, for the period ending July 30, 1949. We found that the books were kept by the retiring Secretary-Treasurer, L. J. Norton, for the period October 30-December 22, 1948. The assets of the Association were checked by examining bank statements and inspecting the stock certificates and bonds kept in a safety deposit box in the First National Bank, Champaign, Illinois. We have checked cancelled checks, bank debit slips, vouchers, and bank statements with expenses as shown in the treasurer's account and found the book statement of expenses correct.

We have checked bank deposit slips, bank credit slips, and bank statements with receipts as shown in the books, and found the book statement of receipts correct. We checked the bank balance on July 30, 1949 with the books and found them in agreement.

The books of the Association have been carefully and correctly kept, and we certify that the financial statement made by the Secretary-Treasurer reflects the financial situation and the transactions of the Association as shown by his records.

Respectfully submitted,
H. C. M. CASE AND
N. R. URQUHART, *Auditors*

MINUTES OF THE EXECUTIVE COMMITTEE, AMERICAN
FARM ECONOMIC ASSOCIATION, LARAMIE, WYOMING,
AUGUST 17, 18, AND 19, 1949

President Wells called the meeting to order at 10:00 A.M. Those present were: O. V. Wells, Bushrod Allin, T. K. Cowden, Asher Hobson, H. R. Wellman, S. C. Hudson, and L. H. Simerl. Also present later were Walter Wilcox and the President-Elect, Warren Waite who presided at the meeting on the 19th.

The minutes of the latest previous meeting of the committee were approved.

The Committee agreed to invite ten persons who rendered special services essential to the success of this annual meeting to be guests of the Association at the banquet.

A motion authorizing the President and the Secretary-Treasurer to fix the amount of the bonds for the latter officer and his secretary was approved. The Committee suggested \$10,000 and \$5,000, respectively.

The President reported that he had been unable to form a committee to begin the special awards program this year. He said that E. C. Young, F. V. Waugh, and Warren Waite had been appointed and had served as a committee to make recommendations as to how such a program might be administered. The report of this committee was received and referred to the President-Elect.

Bushrod Allin reported on problems and progress in the organization of student sections or chapters. The Committee agreed that the AFEA should encourage and advise with student organizations interested in agricultural economics, but should not undertake to issue charters, approve constitutions, or otherwise intervene in the management of these organizations. It was further agreed that undergraduate students should be accepted for membership in the Association on the same basis as graduate students, that is, upon certification by the head of the department giving instruction in agricultural economics and the payment of an annual membership fee of \$3.00.

Dr. Hudson, on behalf of the Canadian Agricultural Economics Society, invited the Association to hold its annual meeting in Canada in 1951.

Dr. Cowden, on behalf of the Michigan State College, invited the Association to meet at East Lansing in 1951 or any succeeding year.

E. C. Young reported on the possibility of the International Conference of Agricultural Economists being held in the U.S.A. in 1951. In that event the AFEA should consider the advisability of coordinating its annual meeting with that of the International group.

Mr. Wells reported on arrangements for joint meetings with the American Economic Association and related societies in New York in December.

The Committee agreed to recommend to the members that a registration fee of \$1.00 be charged at the next annual meeting. This would help meet expenses of the meeting and balance the budget.

The Secretary-Treasurer was instructed to prepare membership and financial reports as of June 30, 1949 that can be used for comparative purposes for the fiscal year ending June 30, 1950. He was also requested to prepare and publish comparative reports as of the end of the current fiscal year.

Walter W. Wilcox was appointed Editor of the JOURNAL for the next year.

In order to furnish transfer officers of corporations with the necessary evidence that the Secretary-Treasurer is authorized to transfer securities in the name of the Association, the following resolution was adopted.

"RESOLVED, that the Secretary-Treasurer (L. H. Simerl of Urbana, Illinois) who is also Chairman of the Investment Policy Committee, be and is hereby authorized and empowered, for, and in the name and on behalf of this Association to take any and all such steps, and to do any and all such things, as may be necessary, required, and appropriate for, or in connection with, the purchase, acquisition, acceptance, handling, pledging, sale, or other disposition of stocks, bonds, and other securities belonging to the Association or pertaining to its business, including the execution, and delivery for and in the name and on behalf of the Association, of any and all endorsements, transfer and assignments of certificates of stock, bonds, or other securities standing in the name of this Association, either for the purpose of sale or transfer, and all such other steps and actions as may be necessary or proper in connection herewith."

The President was authorized to proceed with the special awards program as previously recommended by the Committee, except that the awards for published research consist of three awards of \$250 each.

It was agreed that the 1950 annual meeting would be held at Montreat, North Carolina.

The President, or someone to be named by him, was authorized to go to Montreat to make necessary arrangements for the meeting.

The Executive Committee directed the Secretary-Treasurer to change the membership to a calendar year basis as rapidly as practicable. This change is desirable in the interest of economy and budgeting.

It was agreed that a directory, if prepared, should be sold to members at cost.

Methods of increasing revenues were discussed. These included increased sale of subscriptions to commercial concerns, increased membership in foreign countries, and the sale of more advertising in the JOURNAL.

The Committee agreed to recommend to the membership an amendment to the constitution to provide for the election each year of a President-Elect who would serve as a member of the Executive Committee for one year before becoming President.

The Secretary-Treasurer presented a report indicating a probable deficit of \$1,100 for the fiscal year ending November 30.

Budget estimates for the next twelve-months' period were approved as follows:

Income

Dues and subscriptions	\$9,000
Sale of back numbers	500
Sale of JOURNAL reprints	300
Dividends and interest	2,000
Advertising	100
Total Income	\$11,900
Deficit	1,100
	\$13,000

1304 PROCEEDINGS OF THE ANNUAL BUSINESS MEETING

Expenditures

Printing JOURNAL.	\$9,000
Reprints.....	600
Annual meeting	300
Back numbers...	200
Best article award.. . . .	100
Editorial expense.	750
Library custodian.	30
Office supplies.	120
Postage and wires.. . . .	200
President's expense.	150
Secretary's expense	1,550
	\$13,000

The Executive Committee on behalf of the membership adopted the following resolution expressing appreciation to Dr. Vass and the staff of the University of Wyoming.

"The Association takes this means of expressing our sincere appreciation of the many and varied efforts of the staff of the University of Wyoming which made possible not only the largest, but one of the most pleasant series of meetings in this our first, but we hope not our last, joint session with the Western Farm Economic Association"

There being no further business to come before the Committee, the meeting was adjourned.

L. H. SIMERL, *Secretary-Treasurer*

REPORT OF THE ELECTION TELLERS

We, the undersigned election tellers, report that we have counted the ballots cast for the Association's officers for the year 1949-50. The officers elected are as follows:

President.	Warren C. Waite
Vice-President.	Joseph Ackerman
Vice-President.	K. H. Parsons
Secretary-Treasurer.	L. H. Simerl

Respectfully submitted,
(Signed) BUSHROD W. ALLIN
T. K. COWDEN

ANNOUNCEMENT OF AWARDS FOR MERITORIOUS RESEARCH IN AGRICULTURAL ECONOMICS

During the year 1948, the special grants committee of the American Farm Economic Association solicited funds from business firms and enterprises for the purpose of establishing a fund from which awards could be made for meritorious research. At the time of the annual meeting in September, 1948, Chairman Julius Hendel reported that \$12,925 had been contributed towards this fund. Following this date the committees of the Farm Economic Association have been at work developing a plan by which special awards could be made out of this fund.

At the annual meeting of the Association in Laramie in August, 1949, a program was adopted for making the first awards during the year 1949-1950. Following is a brief statement of the conditions under which these awards will be given.

There are two types of awards: (1) For published reports of research in the field of Agricultural Economics, and (2) For theses submitted in partial fulfillment for the degree of Doctor of Philosophy in departments administering majors in Agricultural Economics.

Awards for Published Reports of Research in Agricultural Economics

1. For the year 1950 there will be three prize awards of \$250.00 each. Each award will be in a different field of Agricultural Economics.

2. Papers which are submitted will be classified in the following fields and persons submitting the papers should indicate the field in which they believe they should be classified.

- (a) Farm management and production economics
- (b) Agricultural marketing
- (c) Agricultural prices
- (d) Agricultural finance
- (e) Land economics
- (f) Theory and methodology
- (g) Agricultural policy

3. Selections will be made from published research bearing the publication dates of 1947, 1948, and 1949.

4. Only papers submitted by persons 40 years of age or less at the time of publication will be considered.

5. The prize awards committee will be made up of seven persons representing the various fields which have been designated. All will be members of the American Farm Economic Association.

6. Papers should be in the hands of the Chairman of the committee, E.C. Young, Purdue University, on or before February 1, 1950.

7. Members of the prize awards committee will not be eligible to submit papers of their own.

8. Announcement of the awards will be made on or before the time of the 1950 annual meeting of the American Farm Economic Association.

Awards for Doctor's Theses

1. For the year 1950 the awards will be as follows: (a) First award will be \$250.00, and (b) two special awards of \$100.00 each.

2. Theses in any field of Agricultural Economics may be submitted. Theses prepared by candidates for the Ph.D. degree in any department of Economics or Agricultural Economics in the United States are eligible for consideration.

3. Selections will be made from theses submitted during the calendar years 1947, 1948, and 1949.

4. The head of each department of Agricultural Economics or Economics in the United States where Ph.D. programs are administered will be eligible to submit one thesis.

5. Theses should be in the hands of the Chairman of the Committee, E. C. Young, Purdue University, on or before February 1, 1950.

6. The prize awards committee will be made up of three persons, all of whom will be members of the American Farm Economic Association.

7. Announcement of the awards will be made on or before the time of the 1950 annual meeting of the American Farm Economic Association.

8. No paper shall receive more than one award but a published Doctor's thesis may be submitted in both classes.

WARREN C. WAITE, *President*
American Farm Economic Association

REPORT OF THE EDITOR

The new editor took over his duties beginning with the May 1949 issue. Every effort was made to continue the high standards maintained by the retiring editor. The following tabular data indicates the use made of the JOURNAL pages in 1949 as compared with 1948. (The Proceedings of the Annual Meeting held in 1948 and printed in February 1949 are included in the statistics for 1948.)

		<i>1948</i>	<i>1949</i>
Articles in regular issues	Number	33	33
	Pages	550	519
Notes in regular issues	Number	23	24
	Pages	137	126
Book Reviews in regular issues	Number	30	31
	Pages	67	68
News Items in regular issues	Pages	26	26
Papers in Proceedings	Number	80	59
	Pages	451	486
Discussion in Proceedings	Number	24	25
	Pages	82	45
Number of Different Authors in Regular Issues and Proceedings			
		177	168

The Executive Committee at its last meeting instructed the editor to keep the Proceedings issue within 400 pages and set a maximum of 1200 pages for the year. Since the editor was unable to keep the Proceedings within the designated number of pages, an attempt will be made to keep the regular issues down to 175 pages and yet print as many articles as before. The cooperation of the membership in submitting somewhat shorter articles will be appreciated.

WALTER W. WILCOX

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